

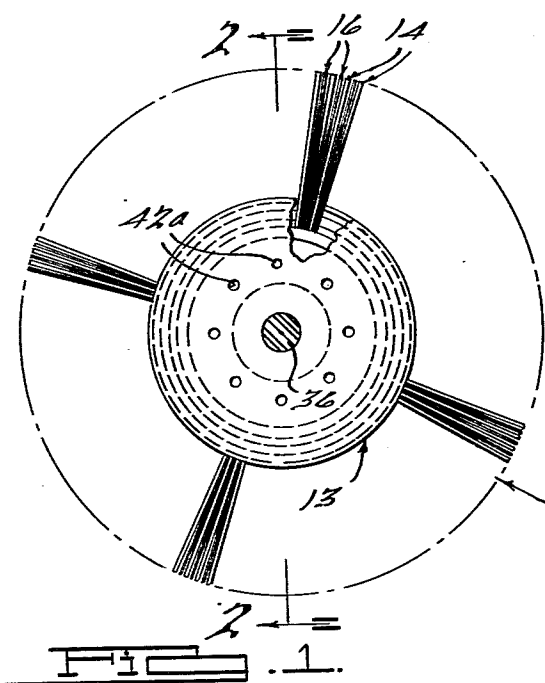
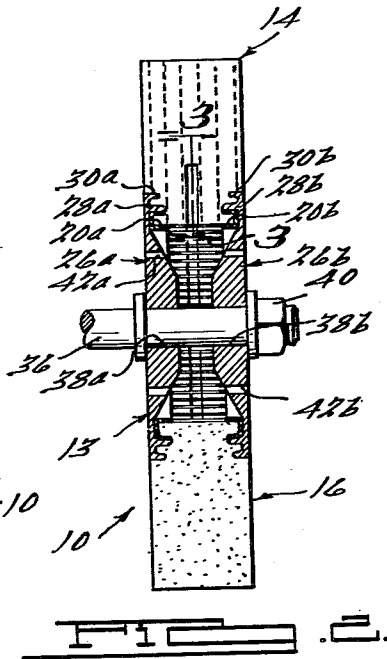
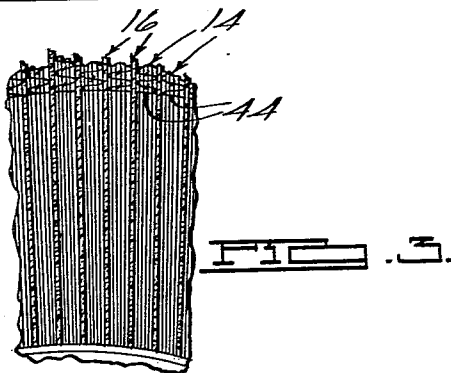
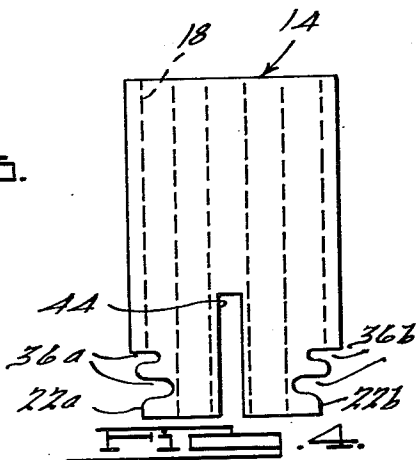
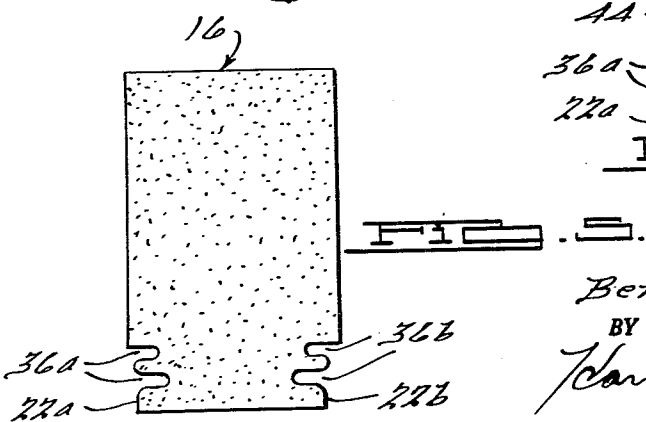
July 30, 1963

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3,099,113

WORK WHEEL

Filed Jan. 18, 1961



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3,099,113

WORK WHEEL

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Filed Jan. 18, 1961, Ser. No. 83,487

1 Claim. (Cl. 51—193.5)

This invention relates generally to apparatus for finishing workpiece surfaces and more particularly to an improved work wheel which includes fingers having abrasive surfaces.

Many abrading wheels are formed of a plurality of fingers which extend radially from the wheel and are connected at their inner ends to a hub structure. Each finger is usually formed of a commercially available sandpaper or the like which is of a relatively low mass and is quite flexible. The principal object of this invention is to provide a work wheel of this type which is capable of an improved abrasive action and, when desired, of a combination abrasive and buffing action. In the wheel of this invention, the abrading fingers are alternated with fingers which constitute back-up fingers for the abrading fingers, thereby accomplishing an improved abrading action from each abrading finger during engagement thereof with the workpiece. In the event buffing of the workpiece is also desired, the back-up fingers are formed of a buffing material such as cloth, sisal, etc. Such a combination buffing and abrading wheel provides a buffing action similar to that of a buffing wheel alone and an abrasive effect which is an improvement over solely abrasive wheels. Thus, work which normally required two different operations and two different wheels can now be performed in a single operation with the combination wheel.

Other objects, features, and advantages of the present invention will become apparent from the subsequent description, taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is a plan view, partially sectioned, showing a combination buffing and abrading wheel embodying certain novel features of this invention;

FIGURE 2 is a sectional view of the combination abrading and buffing wheel shown in FIGURE 1 taken along the line 2—2;

FIGURE 3 is an enlarged fragmentary sectional view taken along the line 3—3 in FIGURE 2, better showing one construction of the combination buffing and abrading wheel;

FIGURE 4 is a plan view of a buffing finger or flap section of the type utilized in the construction of a combination buffing and abrading wheel of the type shown in FIGURE 1; and

FIGURE 5 is a plan view of an abrasive flap section of the type utilized in the construction of a combination buffing and abrading wheel of the type shown in FIGURE 1.

With reference to the drawing, the work wheel of this invention, indicated generally at 10, is shown in FIGURE 1 as including a plurality of radially extending abrading fingers or flap sections 16 which radiate outwardly from a central hub structure, such as the one indicated generally at 13. A back-up finger of flap section 14, which is illustrated as being formed of a buffing fabric and which may be formed of other materials depending upon the type of finish desired on the workpiece, is interposed between each pair of adjacent fingers 16. As the wheel 10 is rotated and is applied to a workpiece (not shown), a riffling action causes each of the fingers 14 and 16 to successively contact the workpiece.

The fingers 14 and 16 are of the same general flat shape, each including pairs of tabs 22a and 22b located

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on either side of its inner end for being matably disposed within a pair of channelled or grooved rings 20a and 20b, respectively, of hub structure 13 (FIGURE 2). Thus, both the buffing fingers 14 and the abrading fingers 16 are restrained axially within the rings 20a and 20b by means of their respective tabs. The rings 20a and 20b are peripherally filled, with the abrading flaps 16 being located regularly around the periphery and individually between adjacent ones of the peripherally disposed plurality of buffing flaps 14.

In the illustrated embodiment of the wheel 10, each of the buffing fingers 14 is constructed of plural layers of cloth folded upon themselves and sewn along the lines indicated by the dotted lines 18 in FIGURE 4; sufficient layers are utilized to impart a desired stiffness and mass for a purpose to be described later.

The abrasive flaps 16 are made of single layers of an abrasive sheet material and the individual ones of the buffing flaps 14 have a considerably greater mass than the individual ones of the abrasive flaps 16. The individual buffing flaps 14 also have considerably greater stiffness to longitudinal bending than the individual abrasive flaps 16.

The hub structure 13 consists of a pair of annular retaining plates 26a and 26b arranged in a coaxial relation on opposite sides of the rings 20a and 20b. The retaining plates 26a and 26b are provided with axially inwardly extending annular flanges 28a, 30a and 28b, 30b, respectively, about their peripheries. The flanges 28a and 30a extend into the notches 36a formed in the fingers 14 and 16 adjacent the tabs 22a and the flanges 28b and 30b extend into the notches 36b formed adjacent the tabs 22b. As thus assembled, the flanges 28a and 28b are in contact with the rings 20a and 20b, respectively. The retainer plates 26a and 26b are drawn together axially by suitable means until the tabs 22a and 22b on the flaps 14 and 16, respectively, fit snugly within the rings 20a and 20b, respectively, and until the flanges 28a, 30a, and 28b, 30b, fit snugly within the notches 36a and 36b, respectively. A resin is applied across the width of the lower portions of the flaps 14 and 16 in the general area of their respective tabs, thereby providing a firm core and further securing the flaps 14 and 16 to the rings 20a and 20b and to the retainer plates 26a and 26b.

In the embodiment shown in FIGURE 2, the wheel 10 constructed as described above can be axially secured upon a rotatable shaft 36 which extends through the centrally disposed bores 38a and 38b in the retainer plates 26a and 26b, respectively, by means of a nut 40 threaded on an end portion of the shaft 36. The shaft 36 and the bores 38a and 38b can be keyed together to prevent rotational slippage.

In past constructions of wheels of this type, the plurality of flaps 14 and 16 have been either solely of the buffing type or solely of the abrading type. In the device as described herein, however, the abrasive flaps 16 are interspersed in regular intervals between adjacent ones of the back-up flaps 14, which can be formed of materials such as leather or rubber. In a wheel 10 having alternate back-up flaps 14 and abrasive flaps 16, a markedly improved abrasive action is realized over a wheel of similar construction but containing only abrasive flaps. Similar results are achieved by varying the mass of the fingers 14.

Also, by forming the back-up fingers 14 of a buffing material such as cloth or sisal, a commercial finish is obtained which is of a type not obtainable either by using solely the abrasive flaps 16 or by using solely the buffing flaps 14. With this combination, improved abrading can be obtained concurrently with a finish of such commercial quality as to obviate a separate buffing oper-

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ation, with the wheel 10. Furthermore, different results are obtainable by varying the number of buffing flaps 14 for each abrasive finger 16. In other words, by merely altering the number of abrading fingers utilized with respect to the number of buffing flap sections utilized, wheels can be provided having variations in abrasive action and in type of finish depending upon individual requirements. Thus, the steps of abrading and buffing, while required to be performed separately in the past, can be performed in a single operation and in a more expeditious manner.

While it is not certain as to the exact cause for the unexpected and meritorious results obtained by the combination of buffing and abrasive flaps in a single wheel, it is believed that this improved action can be attributed to the fact that the abrasive flaps 16 are immediately followed or backed up by a section having considerably greater mass and stiffness to bending, thereby providing increased unit pressures between the individual abrasive flaps 16 and the workpiece.

Cooling of the wheel 10 can be obtained by providing a plurality of axial holes 42a and 42b in the retainer plates 26a and 26b, respectively, and by providing a centrally located longitudinal slot 44 at the bottom portion of each of the buffing flaps 14. Cooling is then effectuated by air being drawn in through the holes 42a and 42b and forced out through the slots 44. For an additional cooling effect the abrasive flaps 16 can be slotted in a similar manner.

While it will be apparent that the preferred embodiment of the invention disclosed is well calculated to fulfill the objects above stated, it will be appreciated that the invention is susceptible to modification, variation and

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change without departing from the proper scope or fair meaning of the subjoined claim.

What is claimed is:

A wheel for working a workpiece comprising a pair of annular channel members, a plurality of elongated flaps each having at one end a first pair of oppositely extending tabs disposed in said channel members, said flaps having a second pair of tabs disposed proximate to said first pair of tabs, a pair of annular retainer plate members each having an annular groove for receiving said second tabs and having an annular recess proximate to said first groove for accepting said channel members, means for axially retaining said retainer plates, said flaps having resin applied across the width thereof in the area of said tabs to thereby provide a firm core for further securing said flaps within said annular channel members and to said retainer plate members, said flaps comprised of a plurality of buffing flaps and a plurality of sandpaper-like abrasive flaps interspersed between adjacent ones of said buffing flaps, said buffing flaps having a substantially greater mass than said abrasive flaps.

References Cited in the file of this patent

UNITED STATES PATENTS

2,678,523	Leggett	May 18, 1954
2,798,343	Block	July 9, 1957
2,842,902	Miller et al.	July 15, 1958
3,004,373	Brooks	Oct. 17, 1961

FOREIGN PATENTS

136,079	Sweden	June 10, 1952
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