

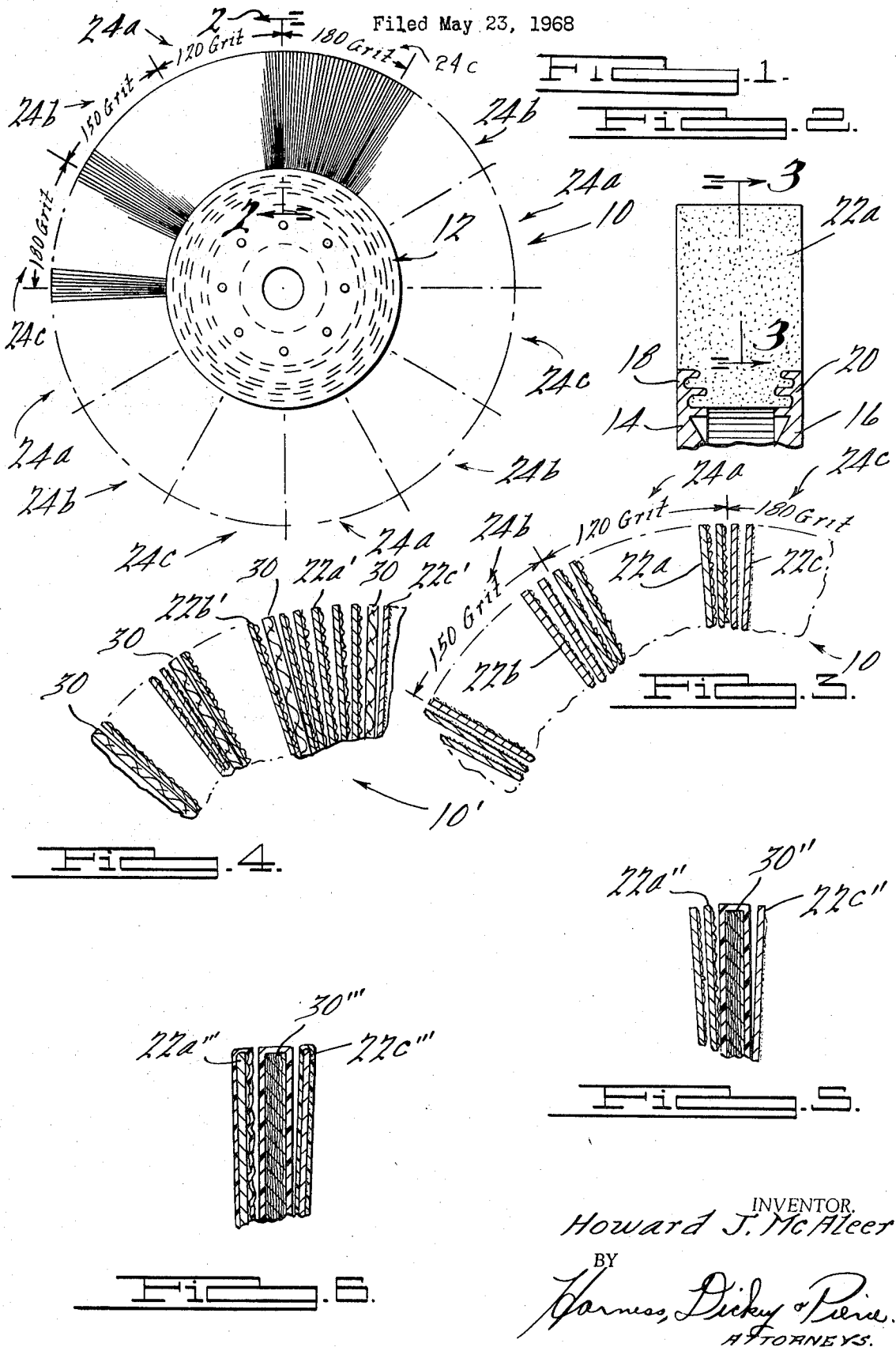
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FLAP WHEEL

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FLAP WHEEL

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ABSTRACT OF THE DISCLOSURE

A flap wheel having a plurality of circumferentially disposed abrasive flaps with some of the flaps being of one grit size and others of a substantially different grit size.

BACKGROUND SUMMARY OF THE INVENTION

The present invention relates to flap wheels and more particularly to flap wheels utilizing abrasive flaps.

Heretofore it has been conventional practice in preparation to plating a steel member to finish the steel member by subjecting it to a plurality of metal removal and finishing operations. The first operation for example, could be finishing the metal on an abrasive flap wheel in which the flaps are cloth or paper-backed coarse abrasive such as 120 grit. While this operation provides substantial stock removal, the finish is coarse and would not be suitable for electroplating. Following the 120 grit operation, the steel member is then finished in a second step by a wheel having flaps with abrasive of 180 grit size. Next a 220 grit flap wheel is used. Finally, if necessary, a buffing operation is performed with a cloth or sisal buffing wheel. In a prior patent to Jeske No. 3,099,113, issued July 30, 1963, a combination cloth and abrasive flap wheel was shown which wheel tended to provide for a combined abrading and buffing action. However, with the wheel constructed in accordance with the Jeske patent if a coarse abrasive, i.e., 120 grit, was used in combination with the cloth, good cutting action would result but the finish would not be adequate for plating purposes. On the other hand, if a finer grit were utilized in combination with the cloth, an adequate finish would result, but the cutting would not be aggressive; hence, it was found that while wheels constructed in accordance with the Jeske patent could possibly replace two finishing steps, as a practical matter, two or more additional finishing operations were required prior to plating. In the present invention it has been found that by constructing a flap wheel to have abrasive flaps with different ones varying in grit size from coarse to fine, a substantial improvement is realized in that a cutting action can be obtained which is similar to that of a wheel comprised solely of the coarse grit while the final finish of the product closely approaches the finish obtained with a wheel solely of the finest grit. As a result, it has been found in fact, that in many applications only a single finishing operation is required to prepare the workpiece for plating.

In a wheel of the above described type it has been found advantageous to also include cloth or sisal flaps which further tend to improve the operating characteristics of the wheel, i.e., cutting action and final finish.

It has further been found advantageous to treat the cloth or sisal flaps by coating these flaps with a resinous type solution. This helps to hold the sisal together preventing it from fraying and also apparently acts as a lubricant; in addition the coating helps the cloth or sisal flaps to retain buffing compound which, when applied to the wheel, further enhances its finishing action.

It has also been found advantageous in wheels of the above described type to coat not only the cloth or sisal but also the abrasive flaps. This also provides for improved operating characteristics.

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Therefore, it is an object of the present invention to provide a new and improved flap wheel construction.

It is another object of the present invention to provide a new and improved flap wheel utilizing abrasive flaps varying in grit from coarse to fine for providing a wheel which is aggressive in cutting and yet results in a fine finish.

It is an object of the present invention to provide a flap wheel of the above described type utilizing abrasive flaps varying in grit size from coarse to fine in combination with cloth or sisal flaps.

Therefore, it is another object of the present invention to provide a wheel of the above described type utilizing cloth or sisal flaps which are coated with a resinous solution.

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

FIG. 1 is an end elevational view of a flap wheel embodying one form of the present invention;

FIG. 2 is a sectional view to increased scale taken generally along the line 2—2 in FIG. 1;

FIG. 3 is a fragmentary sectional view taken generally along the line 3—3 in FIG. 2;

FIG. 4 is a fragmentary view similar to FIG. 3 depicting a modified form of the flap wheel;

FIG. 5 is a fragmentary view similar to the view of FIGS. 3 and 4, depicting another embodiment of the present invention; and

FIG. 6 is a view similar to FIG. 5 depicting another embodiment of the present invention.

Looking now to FIGS. 1 through 3, a flap wheel 10 includes a hub assembly 12 which generally comprises a pair of mounting flanges 14 and 16 which are notched as at 18 and 20, respectively, to receive a plurality of complementarily notched flap members 22a, 22b and 22c which are circumferentially disposed about the hub assembly 12. The flap members 22a—22c on the wheel 10 are all cloth or paper-backed abrasive. The flaps 22a, in one form of the invention, are of a coarse abrasive having a 120 grit size. The flaps 22b are of a medium abrasive having a 150 grit size. The flaps 22c are of a finer abrasive having a 180 grit size. Pluralities of the flaps 22a are located in equally circumferentially spaced sections 24a; pluralities of flaps 22b are located in equally spaced sections 24b; while pluralities of flaps 22c are located in equally spaced sections 24c. An equal disposition of the various flaps 22a—22c is made circumferentially around the wheel 12 in order to provide for good wheel balance. With the wheel 10 constructed as shown and described, a good cutting action results which is nearly equivalent to a flap wheel constructed of abrasive flaps which are solely of 120 grit. The finish, however, on the workpiece is the equivalent of a piece finished on a wheel comprised solely of flaps of 150 grit. In other combinations, the same beneficial results have been noted. For example, with a wheel similar to that shown in FIG. 1 utilizing sections of 150, 180 and 220 grit flaps, the finish was the equivalent of that obtained with the wheel constructed of approximately 200 grit abrasive. Also, more variations could be used, for example, in the wheel shown and described in FIGS. 1 to 3, a fourth, coarse grit size, i.e., 80 grit could be used to provide a more aggressive cutting action with the finish still being proximate to that of a 150 grit wheel. In the embodiments shown in FIGS. 1 through 3, the sections 24a—24c are each 30°. Larger or smaller sections could be utilized as long as the balance of the wheel is maintained. While beneficial results could be obtained with a wheel using only two grit sizes, it is preferred that at least three substantially different grit sizes be used; it is preferred that the difference in grit size be at least around

30 between the various grits. Note that the abrasive flaps can be constructed from conventional cloth or paper-backed abrasives.

A further improvement was found upon the addition of a number of cloth flaps. In the embodiment shown in FIG. 4 components similar to like components in the embodiment of FIGS. 1-3 have been given the same number designation with the addition of a prime. Thus in FIG. 4, sisal flaps 30 are located between adjacent sections 24a', 24b' and 24c' of abrasive flaps.

In order to improve the life and operating characteristics of the cloth or sisal flap 30, it has been found advantageous to coat and/or impregnate the flap with a resinous material which is effective to bond the fibers together achieving a unity of action of the fibers during a finishing operation. The coating protects the sisal from fraying whereby the fibers act in unison providing for improved life and improved surface finishing. A typical coated flap 30'' is illustrated in FIG. 5. The resinous coating also is believed to act as a lubricant effecting a further improvement in the buffing action and finish obtained.

The resinous coating material with which the flap 30'' can be coated and/or impregnated, may comprise any resinous-like material either in monomeric or polymeric form which, when applied to the flap, is effective to adhere the sisal fibers together. Any one of the variety of naturally occurring and synthetic resinous-like materials can be employed for this purpose which are of high strength so as to maintain good adherence of the fibers to each other as well as to resist flaking, fracture, or dislodgment from the flaps during the finishing operation. Typical of naturally occurring resinous materials suitable for this purpose are pine wood rosin, sodium and potassium rosins, bodied linseed oil and castor oil, animal hide glue, sodium caseinate, gum rubber, bituminous-like materials and the like. Typical of the synthetic materials are thermoplastic and thermosetting resins which, if necessary, include plasticizers to maintain flexibility of the resins at the temperatures encountered during the finishing or buffing operation preventing a flaking thereof from the flap. Synthetic resins of this type include alkyd resins, polyvinyl alcohol resins, plasticized polyvinyl chloride resins, plasticized epoxides, polyester resins such as Paraplex AL 16C, modified rosins such as pentaerythritol esters of rosin such as Pentalyn A, pentaerythritol esters of polymerized rosin such as Pentalyn C, pentaerythritol of hydrogenated rosin such as Pentalyn H, pentaerythritol esters of dimeric rosin acids such as Pentalyn K, phenolic modified pentaerythritol esters of rosin such as Pentalyn 833; rosin derived alkyd-type resin such as Neolyn; terpene polybasic acid, plasticized acrylic resins including acrylates and methacrylates such as polymethylmethacrylate, for example; and the like. The foregoing materials can be applied to the flap by any one of a variety of techniques well known in the art, such as dipping, spraying, flooding, roll coating, etc. and can be applied in liquid form employing a heat softened liquid or solution incorporating a volatile solvent so as to achieve penetration of and a bonding of the sisal fibers of the flap together and forming a residuary coating on the exterior thereof. Also the coating is of a type such that it will hold buffing compound. The wheel 10'' with the addition of buffing compound further enhances the buffing action resulting in a finer micro finish.

It has been found that a still further improvement is realized if all the flaps, abrasive 22a'''-c''' and buff 30''', are coated with the resinous solution (see FIG. 6); with such a coated structure, the aggressiveness of the cutting action is slightly impaired, however, coarser abrasive flaps can be used to increase the cutting action. The coating improves the final finish of the stock and also substantially increases the life of the wheel 10'''. In the embodiments of FIGS. 5 and 6 components similar to like components in previously described embodiments have been given the same number designation with the addition of a double prime for FIG. 5 and a triple prime for FIG. 6.

While it will be apparent that the preferred embodiments of the invention disclosed are well calculated to fulfill the objects above stated, it will be appreciated that the invention is susceptible to modification, variation and change without departing from the proper scope or fair meaning of the subjoined claims.

What is claimed is:

1. A flap wheel comprising: a hub, a first plurality of abrasive flaps circumferentially disposed about said hub, a second plurality of abrasive flaps circumferentially disposed about said hub, each of said first plurality of flaps utilizing an abrasive of one grit size, each of said second plurality of flaps utilizing an abrasive of a second grit size substantially different in size from said one grit size, the abrasive faces on said first and second plurality of flaps facing the same direction circumferentially.

2. The flap wheel of claim 1 further comprising a plurality of buffing flaps.

3. The flap wheel of claim 1 comprising pluralities of abrasive flaps of at least three substantially different grit sizes.

4. The flap wheel of claim 3 with said grit sizes including a coarse, a medium and a fine grit.

5. The flap wheel of claim 2 with said buffing flaps being made of a fibrous material and being coated with a resin.

6. The flap wheel of claim 5 including rubbing compound on said flaps.

7. The flap wheel of claim 5 comprising pluralities of abrasive flaps of at least three substantially different grit sizes.

8. The flap wheel of claim 7 with said abrasive flaps being coated with a resin.

9. The flap wheel of claim 8 including rubbing compound on said flaps.

10. The flap wheel of claim 1 with said abrasive flaps being coated with a resin.

11. The flap wheel of claim 1 with said first and said second grit sizes varying from each other by at least 30 grit in size.

12. The flap wheel of claim 1 with said flaps of each said first and said second pluralities being located in a plurality of circumferentially spaced sections.

13. The flap wheel of claim 1 with said sections being equally circumferentially spaced from each other.

References Cited

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