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BUFFING WHEEL

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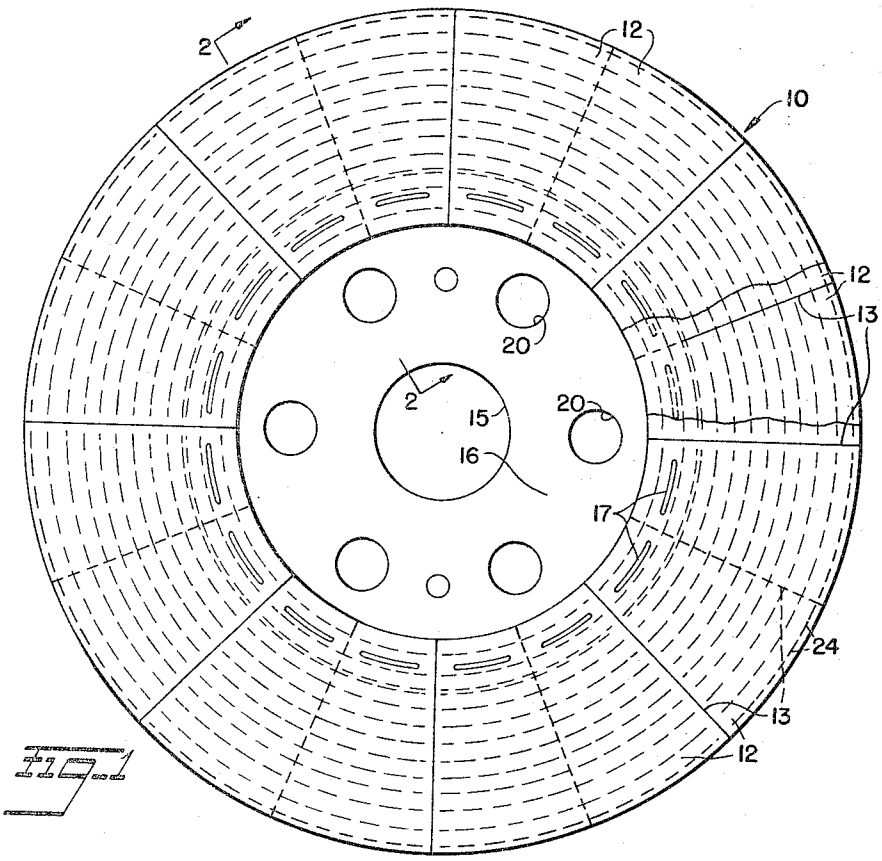


FIG. 1

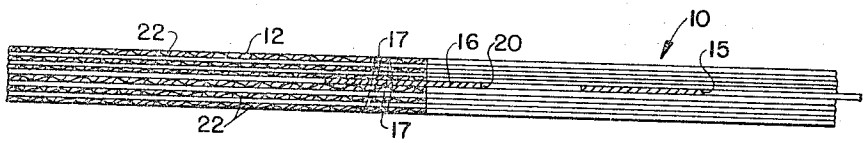


FIG. 2

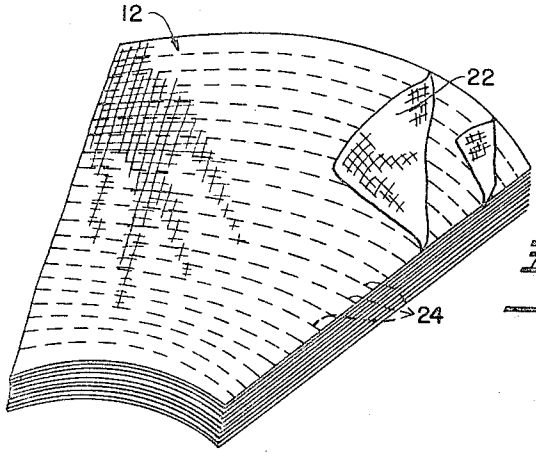


FIG. 3

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BUFFING WHEEL

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ABSTRACT OF THE DISCLOSURE

A buffing wheel composed of individual, separate sectors of cloth or the like, individually attached to both sides of a central metal disc which is provided with vent holes, said sectors of cloth being made from a plurality of fabric layers which are tightly stitched together. In assembly, the sectors form closed side-by-side rings around the central disc but are not attached to each other so as to be individually replaceable.

This invention pertains to buffing wheels and more particularly to a special double sectored buffing wheel assembly mounted on a single flat stiff disc.

Metal products manufacturers of such items as automobile bumpers have found that the buffing and polishing of their products is as a practical matter essential to their marketability. Where these metal products, automobile bumpers for example, are produced annually by the millions, the cost of providing buffing wheels is great. Thus there is a constant need for improved buffing wheels which may be easily and inexpensively manufactured and yet possess long useful life characteristics.

The invention therefore contemplates provision of a novel buffing wheel capable of efficient useful operation at high cutting speeds, which can be produced at comparatively low cost, and which will last longer in continuous service than those hitherto available.

It is the main object of this invention to provide a novel buffing wheel structure wherein a plurality of radially extended wedge shaped laminated cotton sections are fastened as by stapling onto a centrally disposed flat relatively stiff metal disc.

It is a further object of the invention to provide for mounting of these radially extended laminated cotton sectors on both sides of the central disc to provide an air space therebetween, and thus provide a novel double sectored buffing assembly mounted on a single support disc. The sectors on opposite sides are preferably circumferentially equally overlapped.

Another object of the invention resides in the novel provision of concentric stitching of the laminated cotton sections to regulate and maintain the cutting capabilities of the cotton sections within predetermined limits.

A further object of the invention resides in providing a novel sectored buffing wheel structure in which alternate radially extended sectors may possess varying degrees of hardness or cutting capabilities.

Still another object of the invention resides in providing a novel buffing wheel which can be readily constructed of comparatively cheap materials and possesses a prolonged useful work life.

Other objects of the invention and novel features will become evident or will be specilcally pointed out in the following specification and claims in connection with the appended drawings wherein:

FIGURE 1 is an elevation showing a buffing wheel according to a preferred embodiment of the invention;

FIGURE 2 is a partial section of the buffing wheel taken along line 2—2 of FIGURE 1;

FIGURE 3 is an isometric projection of one of the concentrically stitched laminated cotton sector sections.

Buffing wheel **10** comprises a plurality of similarly shaped and sized wedge shaped laminated cotton sectors **12** radially extended from, and concentrically disposed around a circular flat sheet aluminum disc **16**. The sectors are individually fastened to disc **16** by metal staples **17** arranged in a circular row concentric with the central mounting aperture **15** of disc **16**. As shown in FIGURE 2, annular rows of sectors **12** are stapled to opposite sides of disc **16** to form a double-sided segmented assembly. As shown in FIGURE 1 the segments **12** on opposite sides equally overlap circumferentially, thus providing a stiffer assembly. The sectors **12** on each side abut snugly along radial lines **13**. The axial thickness of sectors **12** determines the size of the metal staples used as the prongs of the metal staples when inserted are not bent in any manner but must be of sufficient length to extend through the cotton sectors and the flat aluminum disc. Test buffing wheels with $\frac{1}{16}$ inch flat aluminum stock have been approximately $\frac{3}{4}$ inch thick overall, and have been successfully used over long periods. Thus the disc is stiff enough to resist bending when subject to usual buffing stress.

The centerless aluminum disc **16** is made of flat sheet stock and has several air ventilating holes **20** distributed around aperture **15** for cooling purposes.

With reference to FIGURE 3, each wedge shaped laminated cotton sector **12** consists of a plurality of layers of individual salvaged or scrap woven cotton sheets **22**, the number of which layers can be varied to give a desired depth or thickness. The layers or sheets of woven cotton cloth are bound together by several circumferential rows of stitching **24** concentrically arranged and spaced to assure that such vital wheel characteristics as deflection and cutting ability are maintained within desired limits as the outer diameter of the buffing wheel is reduced by friction wear. The stitching rows **24** neither bridge the adjacent sectors **12** nor extend through the sectors on both sides of the wheel. Each sector **12** is individually stitched.

In effect the concentric stitching limits the lateral deflection of the cotton out of the plane of the wheel at any given time to no more than the width between adjacent rows **24** of stitching, allowing this to partially define the relative rigidity of the cutting edge, and hence the cutting ability of the cotton, within these limits. Thus it is possible to maintain or vary the hardness of the buff within these stated limits by so regulating the stitch spacing. This also makes it possible to fabricate buffing wheels in which alternate sectors, or other combinations of sectors, have different stitch spacing to posses varying degrees of hardness for providing wheels of different cutting abilities.

The invention has been found to be equally well suited for buffing either flat surface bars or radial surfaces, and the wheel of the invention, besides being useful as a buff, can be used for polishing by merely selecting proper stitch spacing and using a steel cutting liquid with the wheel, the latter being capable of eliminating grit lines.

Fabrication of several buffing wheels and test results of usage of these wheels in an automobile bumper production environment has indicated that the present invention, as compared to conventional buffing wheels used heretofore, can be made at about half the cost while providing appreciably longer, approximately double useful life characteristics. Longer life characteristics may be attainable by decreasing the size of disc **16** and by increasing the length of the cotton sectors.

In addition where in the past, a multi-disc buffing wheel comprising a series of side by side assemblies of FIGURE 1, would have utilized seven such assemblies to effectively buff a flat bar, it now takes a multi-disc wheel utilizing

the present invention using only five such assemblies, thus providing for additional savings. A multi-wheel disc made with the novel buffing wheels may utilize compressed paper spacers placed between back-to-back assemblies to reduce wobble and irregular wear of the cloth sectors.

Further savings can be realized in situations where a wheel such as that of FIGURE 1 gets "caught" on a metal bar. In the past this has resulted in tearing of the whole buff and destruction of the usefulness of the wheel, necessitating complete replacement of the unit. With the present invention, ordinarily only one sector of the buffing material will be lost when the wheel gets "caught." Since the sectors are stapled to disc **16**, replacement of the lost sector can be readily accomplished to restore the wheel to original form for continued operational use.

While sectors **12** are disclosed as of cotton they may be made of any equivalent hard fiber sheet material. While disc **16** is preferably of aluminum it may be of any sheet metal, or it may be a plastic of equivalent characteristics for the purpose.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed and desired to be secured by Letters Patent is:

1. A buffing wheel comprising a relatively stiff, thin walled, central support of hard sheet material, two annular rows of side-by-side separate buffing sectors extending radially outwardly from said support on opposite sides thereof, means circumferentially individually fastening all of said sectors of said two rows to said support near its radial outer edge, each of said sectors individually comprising a plurality of separate layers of fibrous material, said layers of fibrous material being closely compressed together across their entire surfaces by rows of tight, closely spaced stitches to rigidify said layers of fibrous material, said sectors remaining separate from each other in assembly.

2. The buffing wheel defined in claim **1**, wherein said central support comprises a metal disc having a central aperture and a plurality of smaller cooling apertures spaced around said central aperture.

3. The buffing wheel defined in claim **1**, wherein said sectors consist of superimposed layers of cloth.

4. The buffing wheel defined in claim **1**, wherein said stitching is arranged in circumferential lines of predetermined radial spacing.

5. The buffing wheel defined in claim **2**, wherein said metal disc is an aluminum disc.

6. The buffing wheel defined in claim **1**, wherein said sectors are individually fastened to said central support at their inner ends along a narrow margin.

7. The buffing wheel defined in claim **1**, wherein said sectors are individually stapled to said central support.

8. The buffing wheel defined in claim **1**, wherein said sectors are substantially identical and replaceable.

9. The buffing wheel defined in claim **1**, wherein the radial inner ends of the respective sectors are secured to said circular support by separate fasteners arranged in a row substantially concentric with the axis of the wheel.

10. A buffing wheel comprising a central disc of sheet metal, a plurality of similar separate buffing sectors secured in closely spaced relationship on opposite sides of said disc near the radial edge thereof, each of said sectors being composed of laminated layers of cloth and being wedge shaped with the inner smaller end secured directly to the disc and side edges of the respective sectors on each side being substantially abutting each other to provide two continuous side-by-side annular rows of said sectors one on each side of said disc, and separate arcuate rows of closely spaced stitching tightly and individually securing together said cloth layers of each of said sectors.

11. The buffing wheel defined in claim **10** wherein said sectors are individually stapled to said central disc from opposite sides.

12. The buffing wheel defined in claim **11** wherein each of the staples pass through said central disc and each of a pair of opposed sectors.

13. The buffing wheel defined in claim **10** wherein the abutting surfaces of adjacent sectors on one side of said disc are circumferentially offset from the abutting surfaces of adjacent sectors on the opposite side of said disc.

14. The buffing wheel defined in claim **10** in which said central disc has a central aperture and a plurality of vent holes spaced around said aperture.

15. A buffing wheel comprising a circular disc of light weight thin gauge sheet metal having a center aperture and a plurality of vent holes spaced around said center aperture, an equal number of individual, separate sectors of cloth or the like fastened radially around the marginal outer edge portion of said disc between said vent holes and said edge and to both sides of said disc so as to form substantially continuous side-by-side sector rings in axially closely spaced relationship, said sectors of said rings alternately overlapping each other and separately attached to said disc, said sectors being composed of multiple layers of cloth individually tightly stitched together so as to form a relatively stiff buffing wheel in assembly in which said sectors remain separate and unattached to each other.

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