March 1, 1938. S. W. LIPPITT 2,109,906

POLISHING WHEEL

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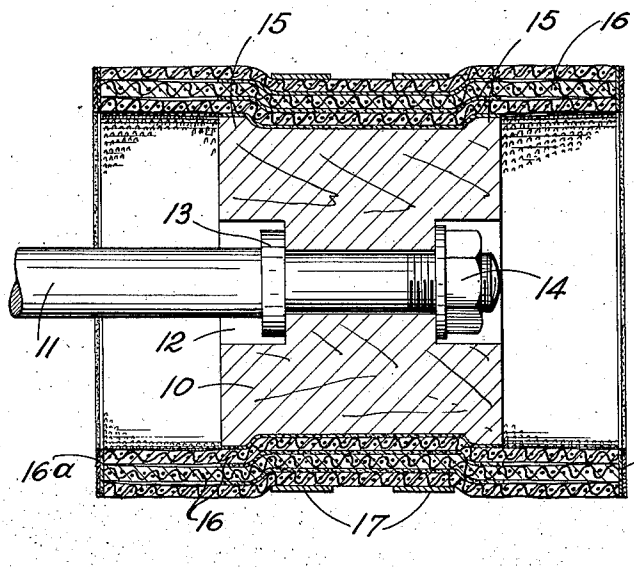
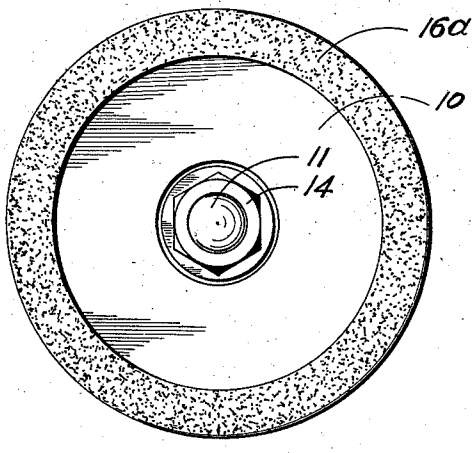


Fig. 1

Fig. 2



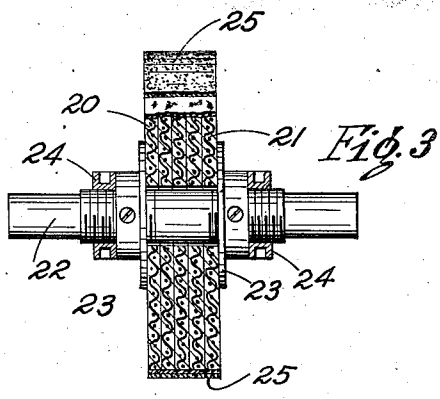


Fig. 3

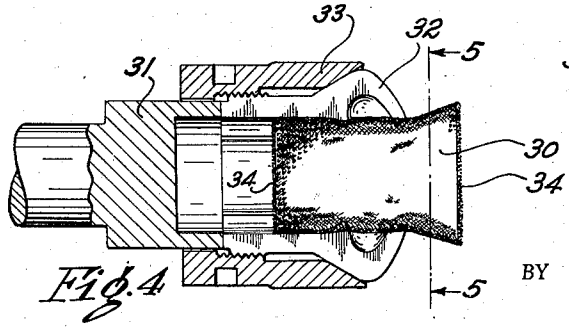


Fig. 4

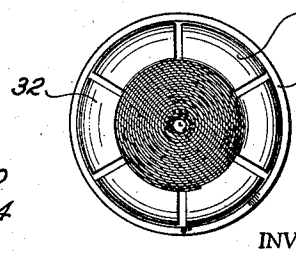


Fig. 5

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POLISHING WHEEL

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8 Claims. (Cl. 51—190)

This invention relates broadly to grinding wheels, and more specifically to improvements in abrasive coated wheels of the type employed for rough polishing or for dressing the work for buffing.

In commercial practice it is customary in surface finishing operations to grind the coarser areas of the work with a grinding wheel which is formed with a yieldable or soft core having the working surface thereof coated with a suitable abrasive. Heretofore such wheels have been made of leather, walrus hide, sheepskin, etc. wound in a helix about a wooden hub to form a disc or cylinder. Such wheels are expensive and in time become too hard for practical use unless the wheels are frequently turned and the glue supporting the abrasive is removed therefrom. Some efforts have been made to substitute fabric for the leather embodying the body of such wheels, but these efforts have met with failure because the fabric becomes too readily impregnated with the glue which cannot be removed and thus becomes too harsh or rigid for such use. Moreover the woven fabric as heretofore proposed was subject to rapid disintegration due to the separation of the warp and weft threads under the centrifugal force applied thereto, with the result that the textiles adjacent the working surface of the wheel would shred, tear, catch the work, or be thrown off.

The present invention contemplates a knitted fabric formed of one or more textiles so entwined as to afford substantial resiliency in the body of the material and formed so that the textiles in the working face of the wheel will not unravel or become separated in any manner whatsoever.

The invention further contemplates a fabric which is formed so that the textile loops in the core thereof will be deformed or work upon application of pressure upon the working surface of the wheel thus preventing glue accidentally reaching such section from hardening the wheel. In addition the invention comprehends a fabric having knitted loops or interstices in the peripheral edge of the wheel to accommodate the entry of the glue or adhesive which supports the abrasive.

In addition to the foregoing objects and advantages, the invention further contemplates a grinding or polishing wheel which is economic of manufacture, durable of structure, and which is much lighter in weight than wheels of this type of the commercially accepted form.

Referring to the drawing in which the preferred embodiments of the several forms of polishing wheels are illustrated:

Fig. 1 is a longitudinal section through a polishing wheel of the type adapted to grind or polish the circumferential edge of a cylindrical body, as for instance the rim of an open cooking vessel;

Fig. 2 is an end elevational view of the polishing wheel illustrated in Fig. 1;

Fig. 3 is a side view partially in section of a disc type polishing wheel including the arbor and supporting flanges therefor;

Fig. 4 is a longitudinal sectional view of an end cutting cylinder including the supporting chuck therefor shown herein in longitudinal section;

Fig. 5 is a transverse section through the polishing cylinder shown in Fig. 4 illustrating the construction thereof, the section being taken on a plane indicated by the line 5—5 of Fig. 4.

Referring first to Fig. 1, the polishing wheel comprises a cylindrical hub or core 10 formed with an axial bore therein for the reception of a stub arbor 11. The core, as illustrated, is counter bored with recesses 12 to receive the flange 13 and nut 14 respectively. The periphery of the core 10 is undercut throughout the greater portion of its length to form shoulders or beads 15 which are adapted to retain the fabric from longitudinal movement upon the core. The body of the polishing wheel is formed of a knitted fabric 16 wound about the core 10 and upon itself to form a wall of a suitable thickness to accommodate the wheel to the work upon which it is to be used. The knitted fabric 16 extends outwardly beyond the forward and rear faces of the core to provide a body or shell which will yield under the application of pressure upon the working edges 16a of the cylinder. In the construction of the wheel the core 10 is preferably first coated with glue or a similar adhesive material, then each convolution of the fabric is glued or cemented together as it is wrapped upon itself to form the tubular body. Before the glue or cementitious material has hardened, wire strands or retractile ferrules 17 are drawn around the fabric adjacent the shoulders 15 in order to assure the adfixture of the fabric upon the core.

In the construction of the fabric the textiles therein are so interlooped and entwined with each other and with themselves as to prevent the textile elements from becoming unraveled or separated when the work is applied to the working face of the wheel, particularly during the operative periods when the glue and abrasive material are worn or partially worn away. A fabric of this character may be formed, for instance by interlooping the textiles in courses arranged in assembly paraxial the cylinder. Such construction will eliminate the possibility of the release of loose, free textiles, fragments or strands thereof and the consequent hazard of extraneous material becoming snagged or caught by the work during the polishing or grinding operation.

The fabric as contemplated herein is knitted of a relatively hard or tightly twisted textile

formed of loops of generous size to form perforations or interstices in the fabric for the admission of the glue and emery in the working faces of the wheel. Such construction varied, of course, in yieldability to suit the particular type of work, will permit the working face and the tubular portion of the fabric intermediate the end of the core 10 and the working face 16 of the polishing wheel, to flex with and follow the contour of the work in a more effective manner than hereto realized with the commercially known wheels of this type.

As illustrated, the fabric overhangs both ends of the core member 10 in order to provide a double working face for the cylinder so that the wheel may be turned end-for-end upon the arbor as the abrasive wears away.

In the form shown in Fig. 3, the polishing wheel 20 comprises a plurality of knitted fabric discs 21 mounted upon an arbor 22 provided with flanges and jam-nuts 23 and 24 respectively, as is customarily employed in discs of the type used for buffing wheels. In this embodiment the peripheral edges of the discs are coated with glue and emery to provide a cutting surface or working edge 25. The fabric in this embodiment is knitted of textiles entwined with each other and upon themselves in such a manner as to prevent the fabric from ravelling about the circumferential edge of the discs. In forming such a fabric, the textiles are preferably looped and interlooped along the radii of the disc sections 20, thus forming a fabric in which the textiles in the periphery of the disc cannot become separated, cannot shred or cannot catch or engage the work as the abrasive coating material wears away. The fabric in this embodiment as in the wheel shown in Fig. 1, is formed of relatively hard textiles loosely entwined together to provide the proper yieldability in the body of the wheel and working edge thereof for the particular type of work to be finished.

The embodiment shown in Figs. 4 and 5 comprises a cylinder 30 of fabric wound in helical form upon itself to provide a solid cylindrical body, the fabric being bound or affixed in such form and being supported by a collet or chuck mechanism to present an end wall or solid working face for engagement with the work. The chuck or gripping device may comprise a tubular body 31 having jaws 32 and a jam-nut 33 adapted to force the jaws inwardly and impinge the cylindrical fabric body 30. In this embodiment the glue and abrasive material is applied to the free end 34 of the cylinder and if desired may also be applied to the opposed end to provide a readily accessible grinding wheel for renewal purposes. The fabric in this embodiment is fashioned in the manner of the fabric employed in the embodiment disclosed in connection with Fig. 1. Obviously the working face 34 may be formed in any suitable configuration to adapt the wheel to the contour of the work upon which the polishing wheel is desired to be used; for example, the face 34 may be conical, concave or both, or fashioned in any configuration complemental to the pattern or shape and form of the work.

Although the foregoing description is necessarily of a detailed character, in order that the invention may be completely set forth, it is to be understood that the specific terminology is not intended to be restrictive or confining, and that various rearrangements of parts and modifications of detail may be resorted to without departing from the scope or spirit of the invention as herein claimed.

I claim:

1. A grinding wheel of the class described comprising a body of knitted fabric yieldable in the direction of the thrust of the work against the wheel, an adhesive and abrasive on the work engaging face of the wheel, said fabric being knitted to define interstices for the reception of said adhesive.

2. A grinding wheel of the class described comprising a body of knitted fabric yieldable in the direction of the thrust of the work against the wheel, said fabric comprising a plurality of layers of knitted textiles, said textiles being interlooped and entwined to form a fabric body which when assembled in said wheel is free of circumferential strands.

3. A polishing wheel of the class described comprising a plurality of layers of knitted fabric, each of the layers thereof being knitted to form a yieldable fabric body, an adhesive coating on a peripheral face of said wheel, an abrasive therein, said fabric being knitted with looped stitches defining openings for the reception of said adhesive.

4. A grinding wheel of the class described comprising a cylindrical body formed of a plurality of convolutions of knitted fabric, said fabric comprising a plurality of textiles interlooped and entwined in parallel courses, said fabric being arranged in said wheel with the textiles which define the ends of said courses disposed for engagement with the work.

5. A polishing wheel comprising a cylindrical body formed of a plurality of convolutions of knitted fabric, said fabric comprising textiles interlooped and entwined to form ribs, said fabric being arranged in said wheel with said ribs circumambient the axis of rotation of said wheel and with the textiles in the ribs which form a marginal edge of the fabric disposed for engagement with the work.

6. A grinding wheel of the class described comprising a cylindrical body formed of a plurality of convolutions of knitted fabric, said fabric comprising a plurality of textiles interlooped and entwined in parallel courses, said fabric being arranged in said wheel with the courses disposed parallel the axis of rotation of said wheel.

7. A polishing wheel comprising a cylindrical body formed of a plurality of convolutions of knitted fabric, said fabric comprising textiles interlooped and entwined to form ribs, said fabric being arranged in said wheel with said ribs circumambient the axis of rotation of said wheel.

8. A polishing wheel comprising a cylindrical body formed of a plurality of convolutions of knitted fabric, said fabric comprising textiles interlooped and entwined to form courses, said fabric being arranged in said wheel with said courses parallel the axis of rotation of said wheel and with the ends of said courses constituting the ends of said cylindrical body, and an abrasive laden adhesive on the textiles forming the end portions of said cylindrical body.

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