

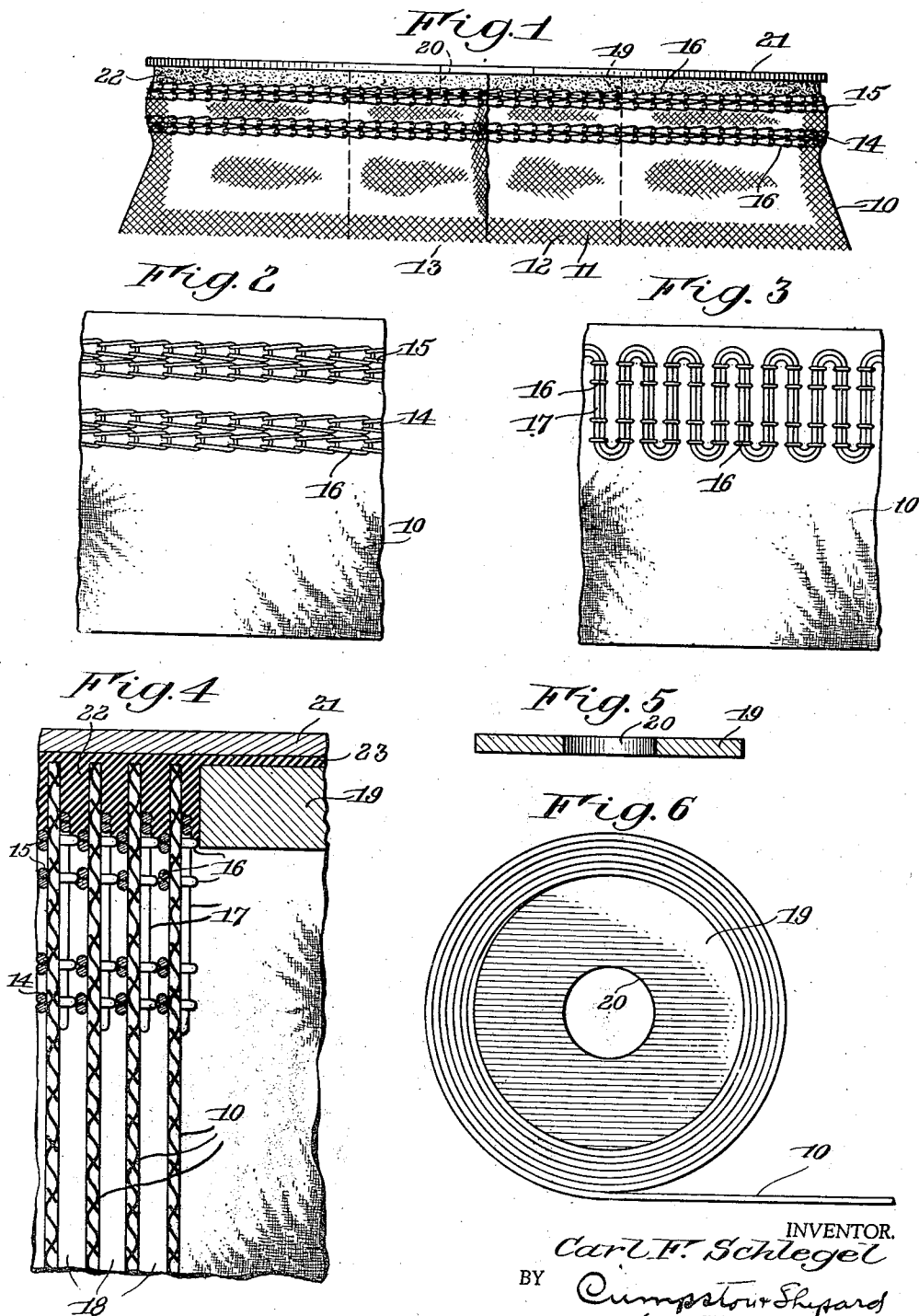
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POLISHING DISK

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POLISHING DISK

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7 Claims. (Cl. 15—230)

The present application is a division of my abandoned application, Serial No. 267,269, filed April 11, 1939.

This invention relates to polishing pads or disks for polishing a variety of articles, such, for example, as metal sheets, automobile bodies, furniture and the like, one object being to provide a generally improved pad or disk of a relatively simple and inexpensive type, having a unitary and durable construction capable of adaptation to a variety of uses.

Another object is the provision of a disk of the above nature having a flexible type of construction adapted to conform to and polish either regular or irregular surfaces, efficiently and with minimum labor.

Another object is the provision of such a polishing element having a polishing face formed by the free edges of a multiplicity of textile strip convolutions, of a predetermined density and firmness, and which are securely anchored at their opposite edges in the body portion of the element.

A further object is the provision of an article of the character described having a round and balanced construction adapted for mounting conveniently upon a motor driven mandrel for rotation at relatively high speeds.

To these and other ends the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawing:

Fig. 1 is a side elevation of a polishing disk embodying the present invention;

Fig. 2 shows the stitching on one side of the textile strip employed in forming the disk;

Fig. 3 is a view of the reverse side of the strip shown in Fig. 2;

Fig. 4 is an enlarged sectional view on a radial plane of the disk;

Fig. 5 is an enlarged sectional view through the core or hub of the disk, and

Fig. 6 is a top plan view of the disk before application of the backing strip and with the polishing strip partially wound.

The same reference numerals throughout the several views indicate the same parts.

In the preferred embodiment of the invention herein disclosed by way of illustration, the polishing disk is made of a strip of woven textile material 10, which may be woven with strands of any suitable fibrous material, or partly of fine wire, as different adaptations to different

uses may require. Such fibrous material may include one or more known varieties, such as cotton, linen, wool, flax, jute, hemp, silk or rayon, but, for most uses, woolen or cotton fibers are preferred, depending upon the surface to be polished and the desired texture of the polishing face, as well understood in the art. Preferably, also, the fabric is rather loosely woven, substantially throughout its width, from one lateral edge to the other, and preferably cut on the bias, as shown in the drawing, so that the individual strands 11 and 12 both extend at an angle to the longitudinal direction of the strip. By cutting the strip on the bias, the fibers or strands at the polishing face 13 are made less likely to unravel to an excessive extent.

Extending lengthwise of the strip are rows of stitching of which any desired number may be employed, but, preferably, the stitching is placed in zones 14 and 15 each of which may be made up of two rows of chain stitching 16. The chain stitching 16 is preferably employed to secure to and embody in the strip 10 a continuous strand 17 of textile material, as best shown in Fig. 3. The strand 17 is preferably zigzagged back and forth across a portion of the width of the strip and held in position by the chain stitching, as shown. If desired, two or more strands 17 may be employed to increase the over all thickness of the strip adjacent the zone of stitching. It will be noted that the chain stitching is primarily employed to produce a predetermined thickness in the strip adjacent the zone of stitching, rather than to secure adjacent strip thicknesses together. Thus the chain portion of the stitching appears on one side of the strip 10 while the loops thereof extend through the strip, as shown in Fig. 3, to secure the filler strands 17 in position.

Such zigzag strands may be of any desired thickness, in accordance with the desired spacing between adjacent convolutions of the strip when wound on the central core hereafter described. The appearance of the material in section is shown in Fig. 4, wherein it will be observed that the strands 17 and the chain stitching 16 serve to space adjacent convolutions of the strip from each other. By varying the diameter of the strands forming the chain stitching 16 and the number and diameter of the filler strands 17, the spacing of adjacent convolutions at the polishing face, as shown at 18, may be varied as desired.

The strip 10 may be wound more or less tightly on a core or hub of any suitable material, and preferably comprising, for example, at least one disk 19 of fibrous hemp material. Compressed

hemp disks have been found to be satisfactory, as disks of this type are inexpensive, and, while semi-rigid, are sufficiently flexible for the desired flexible use of the disk and will not cause an abrasion of the work to be polished should the disk come in contact with it. The core has a concentric aperture or opening 20 for the reception and attachment of a spindle upon which the polishing disk is adapted to be mounted and by which it is rotated or driven at suitable speed.

The core 19 serves as a form around which the textile strip is wound and at the same time serves as a hub for operating the polishing disk. In winding the strip on the core, the core may be placed on a rotatable spindle, one end of the strip secured to the core, and the core rotated while the strip is held taut, and fed so as to wind the strip spirally upon the core and upon itself until a series of convolutions are formed, as described and as shown in Fig. 6.

After the strip has been wound at one edge upon the core, as shown, the surface formed by such adjacent edges of the convolutions is given a coating of a flexible adhesive material, such as a rubber compound and, preferably, the well known liquid latex compound, which, upon curing, remains permanently flexible. The tenacity and permanent flexibility of latex has been found to be particularly satisfactory for this purpose, and while the convolution edges may be dipped in such latex, it has been found that the desired coating may be incorporated by painting the edges with the latex. A surplus of the adhesive is preferably employed so that it tends to flow down between the convolutions, as shown at 22, Fig. 4, and bind the fibers to each other. The rows of stitching, where the strip is tightly stitched and wound, act as a dam to prevent the latex from flowing beyond such stitching. The adhesive serves also, of course, to secure the inner convolutions to the core 19.

After the latex has been applied to the convolution edges, a circular buckram or canvas backing sheet 21 is applied over them while the latex is still in liquid condition. Preferably, also, the latex is applied between the core and the backing sheet, as shown at 23, Fig. 4. The spirally wound convolutions are thus intimately bonded to each other and to the core and to the backing sheet, so that the structure is, in effect, a single, integral unit.

While the layer of latex may be of any desired thickness, I have found that a relatively thin layer is preferable, and that a polishing disk may be made in this manner so as to be readily flexible in use. The use of latex, particularly with a flexible core, enables the disk to flex as a whole in a direction perpendicular to the plane of the polishing face, without cracking or other disintegration or detachment of the fibers.

The backing sheet of canvas or buckram is provided primarily to give strength to the disk in a direction radially of the axis of rotation, or, in other words, against centrifugal force. It will be appreciated that the polishing disk shown and described herein is intended to be rotated at relatively high velocity. The effect of centrifugal force is to cause the fibers to turn outwardly and the canvas or buckram backing serves to prevent the peripheral fibers from separating from the remainder of the disk.

One of the important features of the invention is the provision of means for varying the density at the polishing face of the disk. It will be appreciated that the various uses to which pol-

ishing disks are applied require polishing faces of differing softness and compactness. By the means of my invention a ready control of the compactness of the mass of the fibers at the polishing face is possible.

While I have shown the preferred form of embodiment of my invention and described the preferred method of constructing the polishing disk, it is contemplated that various changes may be made, particularly in the form and relation of parts, without departing from the spirit of the invention, or the scope of the appended claims.

I claim:

1. A polishing disk comprising a strip of woven material cut on the bias and wound upon itself to form a disk having a multiplicity of convolutions, a plurality of rows of stitching running longitudinally along said strip approximately parallel to each other and to one edge of said strip, to increase the effective thickness of said strip in the vicinity of the stitching so as to space the convolutions formed by other portions of said strip from each other, and a backing of latex in which one face of the disk is embedded to thus provide a polishing disk which in use is flexible as a whole in a direction perpendicular to the body.

2. A polishing disk comprising a strip of woven material cut on the bias and wound upon itself to form a disk having a multiplicity of convolutions, means including stitching extending lengthwise along said strip for spacing adjacent convolutions of the strip from each other, and a backing of latex in which one face of the disk is embedded to thus provide a polishing disk which in use is flexible as a whole in a direction perpendicular to the body.

3. A round, rotatable, flexible polishing disk comprising a core of compressed hemp having a central opening for attachment to a rotary driving spindle, a strip of textile material woven substantially from one lateral edge to the other and wound around said core and upon itself in spiral convolutions to form said disk, and a coating of flexible latex adhesive uniting said convolutions to one another at one edge thereof and to said core to form a supporting body which is flexible as a whole, said convolutions being free at the opposite edge thereof to form the textile polishing face.

4. A round, rotatable, flexible polishing disk comprising a flexible core having a central opening for attachment to a rotary driving spindle, a strip of textile material woven substantially from one lateral edge to the other and wound around said core and upon itself in spiral convolutions to form said disk, a flexible backing sheet, and a coating of flexible latex adhesive uniting said convolutions to one another at one edge thereof and to said core and backing sheet to form a unitary structure, said convolutions being free at the opposite edge thereof to form the textile polishing face and said disk being flexible as a whole and balanced for rotation about the axis of said core opening.

5. A round, rotatable, flexible polishing disk comprising a flexible core having a central opening for attachment to a rotary driving spindle, a strip of woven textile material cut on the bias and wound around said core and upon itself in spiral convolutions to form said disk, a flexible backing sheet and a coating of flexible latex adhesive uniting said convolutions to one another at one edge thereof and to said core and backing sheet to form a unitary structure, said convolu-

tions being free at the opposite edge thereof to form the textile polishing face and said disk being flexible as a whole and balanced for rotation about the axis of said core opening, the diameter of the outermost convolution of the completed disk being materially greater than the axial thickness of the completed disk.

6. A flexible, rotatable polishing disk comprising a textile strip of strands of fibrous material woven substantially throughout the width thereof and cut on the bias, said strip being arranged in convolutions to form a disk-shaped structure with the convolutions extending spirally with respect to a central axis and forming together at one edge a circular textile polishing face, the opposite edge of said convolutions having the interstices between the interwoven strands substantially filled with an adhesive material which is flexible after curing and intermingles with said strands and binds them into a mass which is flexible as a whole in a direction normal to the plane of said disk, and filler means including a filler strand extending back and forth in zigzag

fashion on one face of said textile strip and stitching extending through said strip to secure said strand thereto to produce a predetermined spacing between said convolutions and a predetermined density in said polishing face.

7. A flexible polishing disk comprising a flexible core having a central opening for attachment to a rotary driving spindle, a strip of textile material woven from edge to edge and wound around said core and upon itself to form a disk-shaped structure with said windings extending spirally about the axis of said opening and together forming at one edge a circular polishing face, the opposite edge only of said windings being impregnated with a flexible rubber composition which enters the interstices and secures the weft and warp strands together and the marginal portions of successive windings adhesively to one another, said rubber composition extending as a flexible connective binder body throughout the successive windings of the strip on the side of said disk opposite said polishing face.

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