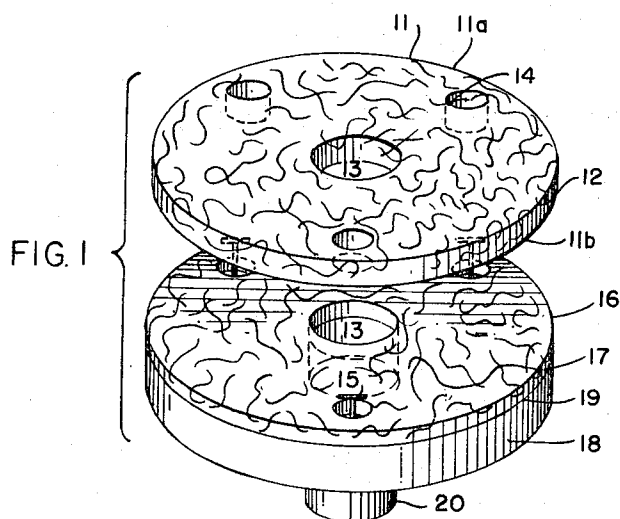
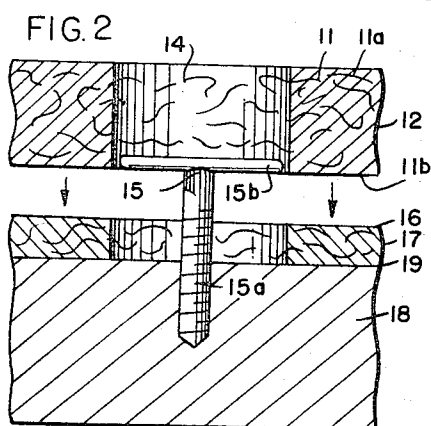
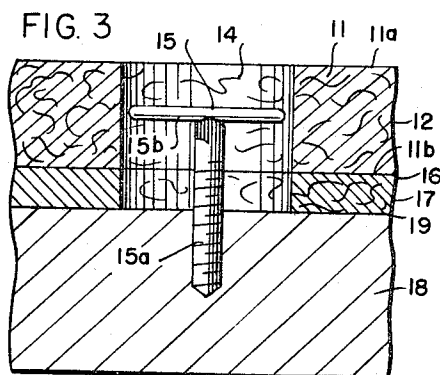
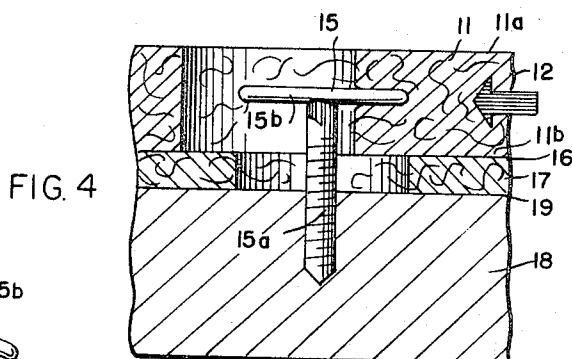
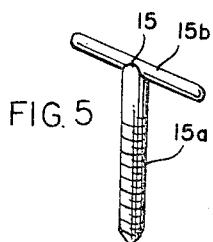


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SURFACE CONDITIONING PAD
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SURFACE CONDITIONING PAD

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This invention relates to an apparatus for fastening a surface conditioning pad to a backup pad on a machine which transmits motion through the backup pad to the conditioning pad which is used for preparing and maintaining surfaces. More specifically, the invention relates to an apparatus for fastening woven and nonwoven, abrasive and nonabrasive pads suitable for preparing and maintaining surfaces by abrading, stripping, scrubbing, polishing, etc. the surfaces.

Many problems have plagued the industry in producing simple conditioning pad fasteners. Attaching the conditioning pad easily and quickly has always been a problem. Quick and easy removal of the conditioning pad without the use of tools and/or accessories has also been a problem. Many fastening devices heretofore known have necessitated the use of special devices such as nuts and bolts, pins, mounting discs and similar accessories, in addition to adapters of various types built into the conditioning pad. A patent to Winslow No. 407,270 shows an arrangement for attaching a circular abrasive sheet to a felt pad by means of pins. Another patent, No. 2,008,260 to Reineman shows a circular sheet metal mounting disc provided with prongs stamped from the disc and inclined downward at an acute angle to hold the metallic wool pad. In many of the pad fastening methods and devices previously known, positive centering of the abrasive on the backup pad in combination with simple, quick, effective installation was not available. Adhesive backings on abrasive pads have also been used as a method for attaching the abrasive pad to the backup pad; however, this requires the adaptation of an adhesive to one side of the abrasive pad thus preventing the use of one side of the pad after the other has become worn. Also, when adhesives are used, the backup pad surface must be specially constructed to accept the adhesive in order to bind the pads together. Even then, the problem of obtaining a secure binding of the two pads by adhesive has not been satisfactorily solved.

Accordingly, a principal object of this invention is to provide a simple device for quick, easy, positive fastening of the conditioning pad to the backup pad.

A further object of this invention is to provide a simple device not only for easy, positive fastening, but also for quick release.

A further object of this invention is to provide a simple device allowing a method for easy fastening and quick release so that the pad can be turned over for use on the fresh side.

A further object of this invention is to provide a simple fastening device that permits positive alignment and centering of the juxtapositioned conditioning pad with the backup pad.

In the accompanying drawing, in which is shown one of various possible embodiments of the several features of this invention:

FIG. 1 is a perspective view including a backup pad incorporating our fastening devices and surface conditioning pad juxtaposed above the backup pad.

FIG. 2 is a broken cross-sectional view illustrating the first entry of the fastening device into the pad as it is placed in position on the backup pad.

FIG. 3 is a broken cross-sectional view illustrating the extent of entry of the fastening device after one face of

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the pad has been placed in contact with the surface of the backup pad.

FIG. 4 is a broken cross-sectional view illustrating the penetration of the fastener into the pad after fastening.

FIG. 5 is a perspective view of a fastener removed from the backup pad.

Referring to the drawings, our invention can best be illustrated by the perspective view in FIG. 1 where the upper disc 11 represents a conditioning pad having a thickness 12 bounded by flat circular surfaces 11a and 11b and having a central opening 13. Symmetrically placed on radial lines extending from the center of disc 11 are three circular openings 14 through the thickness 12 of pad 11 for receiving T-bar fasteners 15. The openings 14 are situated in pad 11 in such a manner that pad 11 can be juxtapositioned against the surface 16 of backup pad 17. Backup pad 17 is affixed to the backup plate 18 by adhesive or other suitable bonding material at their adjoining faces 19. Backup plate 18 terminates in a centrally located chuck 20 or other suitable means for engagement with a power source to transmit rotational motion to the backup plate 18, the backup pad 17 and the abrasive pad 11 when fastened into position against the surface 16 of backup pad 17.

The surface conditioning pad 11 illustrated in FIG. 1 may be made of web type non-woven fibrous material such as nylon, rayon, animal hair, etc. The fibers may be bonded by any suitable binder at the points of intersections of the fibers. Abrasive grains may or may not be bonded to the fibers. A surface conditioning pad used for polishing will not have abrasive grains; however, a pad used for stripping contains an abrasive.

The broken exploded view in FIG. 2 illustrates more clearly the relative sizes of the fastener 15 and the openings 14 in pad 11 extending through thickness 12 adapted to receive the T-bar fastener 15. FIG. 2 particularly displays the fit of T-bar 15 in opening 14 as pad 11 is being placed into position. FIG. 2 further illustrates the ease of positive centering of pad 11 because as it is placed over T-bar 15 in the position demonstrated in FIG. 2, positive centering is incidental thereto.

FIG. 3 shows conditioning pad 11 joined with backup pad 17. The surface 11b of pad 11 rests upon the surface 16 of backup pad 17. FIG. 3 also illustrates the relative height of T-bar 15 and the thickness 12 of pad 11. T-bar 15 extends approximately to the mid point of thickness 12 of pad 11. This arrangement assures that a substantial thickness of conditioning pad 11 extends between the exposed surface 11a of pad 11 and the top of the rigid T-bar 15 in order to protect the surface being conditioned from damage by the T-bar.

FIG. 4 illustrates the final step involved in the simple operation of positioning pad 11 on the backup pad 17 so that either side of T-bar 15 penetrates pad 11. This is done by rotating pad 11 relative to backup pad 17 a very short distance in a direction counter to the direction of rotation of backup pad 17 and backup plate 18. As pad 11 is rotated with respect to pad 17, plate 18 and T-bar fasteners 15, either tip of the horizontal bar 15b of T-bar 15 enters the fibers of the conditioning pad 11 as pad 11 is urged against the tip. FIG. 4 shows the entry of the tip which provides a secure fastening of the pad 11 to the rotating backup pad 17 and plate 18. The three symmetrically placed T-bar fasteners 15 each have an upright member 15a embedded in the backup plate 18 by any suitable means such as by bonding, screwing, etc. in order to hold the T-bar in a rigid stationary position with the horizontal bar 15b oriented tangentially to the circumference of a circle concentric to the circular periphery of surface 16 of pad 17, and inscribed over the face 16 of the pad 17 having its center coincident with central opening 13.

The preferred embodiment of the T-bar fastener shown in the perspective view of FIG. 5 includes a vertically extending cylindrically shaped member 15a terminating at the lower end in a point and terminated at the upper extremity by a cylindrically shaped horizontal bar 15b connected at its mid point to lower member 15a by any suitable method such as welding, heat pressing, etc. The lower surface of the vertical cylindrical member 15a may be threaded for engagement with the backup plate 18 illustrated in FIGS. 2, 3, and 4. An alternative to threading would be alternate transverse rings and grooves around the vertical member 15a or any other surface configuration that would accept a bond to ensure that T-bar 15 would be rigidly secured in and to backup plate 18.

The foregoing discussion of the FIGS. 1-5 in the drawing has set forth briefly the preferred embodiment of our surface conditioning pad fastening device and a simple method by which the conditioning pad may be attached to a machine equipped with our fasteners. Referring again to FIG. 4, it becomes readily apparent that after the exposed surface 11a of pad 11 has been used, when rotation stops, pad 11 can be removed by a short twist of pad 11 in the direction of rotation of the machine to the position shown in FIG. 3, thereby disengaging the tips of horizontal bars 15b from the conditioning pad 11. Pad 11 can then be lifted off the backup pad 17 and T-bars 15. Used surface 11a of pad 11 can then be juxtaposed against surface 16 of pad 17 as illustrated in FIG. 3 and pad 11 can be rotated a short distance counter to the direction of rotation of the machine to securely fasten pad 15 to backup pad 17 and plate 18 through the engagement of one tip of bar 15b with pad 11 which now has the unused surface 11b exposed for use.

A further embodiment of our invention may best be explained by reference to FIG. 1 wherein the openings 14 in pad 11 of FIG. 1 do not extend completely through thickness 12 to intersect surface 11a. In this embodiment, the openings extend from surface 11b only to the mid point of thickness 12 of pad 11 to accommodate the T-bar fasteners 15. This leaves outer surface 11a of pad 11 free of openings 14. In this embodiment pad 11 can not be removed, turned over and replaced with the unused side exposed because the openings 14 in pad 11 do not extend completely through thickness 12.

It is apparent that many widely different embodiments of this invention may be made without departing from the spirit and scope thereof; and therefore, it is not intended to limit the present invention except as indicated in the appended claims.

The invention is claimed as follows:

1. In combination, a reversible surface conditioning pad having symmetrically spaced openings, a backup pad, a backup plate, and a plurality of T-shaped fasteners having a cross-bar mounted at its mid point on the upper extremity of an upwardly extending member attached to the face of said plate, said fasteners adapted to be inserted into said openings of said conditioning pad to hold said pad to said plate.

2. In combination, a backup plate, a backup pad attached to said plate, a reversible surface conditioning pad, and a plurality of T-shaped fasteners each of said fasteners having a member extending perpendicularly outward from said plate through said back-up pad, said perpendicular member terminated at its upper end by a cross-bar, said conditioning pad having openings adapted to receive said fasteners, said cross-bars oriented to penetrate the interior of said conditioning pad to hold said pad against said backup pad and plate.

3. In an apparatus for fastening surface conditioning pads to a backup plate including a plurality of T-shaped fasteners protruding from said plate, each of said fasteners having a cross-bar parallel to the surface of said plate, and a surface conditioning pad having a plurality of openings adapted to receive said fasteners to hold said pad to said plate.

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