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(57) ABSTRACT

An pad for polishing, buffing, compounding, and glazing comprises: a working pad of open-cell foam or absorbent natural padding; an insert affixed to said rear surface of said working pad, said insert having a coupling disposed in the center thereof for engaging a corresponding coupling of a drive shaft of a driving device; a first carrier layer disposed between said rear surface of said working pad and said insert; a first affixing layer disposed between said carrier layer and said rear surface of said working pad; a second affixing layer disposed between said insert and said first carrier layer so as to fix said insert to said first carrier layer; a second carrier layer disposed upon the side of said insert opposite said working pad; a third affixing layer disposed between said second carrier layer and said insert wherein said insert has an aperture passing therethrough to allow for material to pass therethrough to secure said insert to one or more of said first carrier layer and said second carrier layer.
PAD, SYSTEM AND METHOD FOR POLISHING, BUFFING, COMPOUNDING AND GLAZING

[0001] This application is based on, and claims priority to: U.S. provisional application Ser. No. 60/767,295, filed Mar. 15, 2006, entitled Buffing and Finishing Pad; and U.S. provisional application Ser. No. 60/746,357, filed May 3, 2006, entitled Polishing, Buffing, Compounding, Glazing Pad.

FIELD OF THE INVENTION

[0002] This invention relates to a surface-treatment pad, which a pad used for any combination of polishing, buffing, compounding, and glazing. This invention also relates to systems and methods for polishing, buffing, compounding, and glazing.

BACKGROUND OF THE INVENTION

[0003] Conventionally buffing pads are driven by motors on “polishers” and are used to perform polishing, buffing, compounding, and glazing. The motor has a rotating drive shaft, which conventionally accommodates threaded engagement. In conventional buffing methods, the buffing pad includes a working pad having at least one generally planar working surface. The buffing pad conventionally is attached to a drive motor by means of a backing plate, which is a plate that is attached to the drive shaft of the motor. The backing plate is generally round and generally planar and has a rear side with appropriate hardware for attachment to the drive shaft; the backing plate also has a front side that faces away from the drive assembly toward the workpiece. The front side of the backing plate conventionally has an attachment device, commonly a hook-and-loop fastener such as Velcro®, for attaching a working pad to the backing plate.

[0004] In mounting conventional buffing pads to these conventional backing plates, many users have difficulty in mounting the working pad so that it is “centered” on the backing plate. When the workpad is mounted off-center and the drive motor rotates the pad, the result is wobbling or vibration that may make the device difficult to handle and that may cause excessive wear or damage to equipment or to the treated surface. Some devices provide a central aperture in the surface of the working pad to aid correct positioning, but a central aperture can cause difficulties by trapping dirt particles or treatment fluids such as waxes of glazes.

[0005] Further, the use of backing plates often results in a surface-treatment system of relatively high weight and stiffness. These heavy, stiff systems can lead the user to damage the treated surface by gouging it.

SUMMARY OF THE INVENTION

[0006] Some embodiments of the applicant’s invention provide one or more of the following advantages: easy attachment of the surface-treatment pad to the drive shaft; easy centering of the surface-treatment pad on the drive shaft; elimination of the difficulty of centering pads attached by hook-and-loop fasteners; providing a smoother, more level contact surface between the surface-treatment pad and the workpiece; eliminating the use of a traditional back-up pad for attaching a buffing pad to a drive motor; reducing labor; reducing gouging of the surface being treated; reducing wobbling or vibration of the surface-treatment pad; providing greater flexibility of the surface-treatment pad as compared to surface-treatment pads using backup plates; and saving time.

[0007] This general description is not intended to limit the scope of the invention as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. 1 shows an exploded isometric view of an example of a surface-treatment pad and a spacer according to the invention.

[0009] FIG. 2 shows an exploded isometric view of an example of a surface-treatment pad and a spacer according to the invention.

[0010] FIG. 3 shows a perspective view of example of a surface-treatment pad having surface levels disposed at least two different elevations according to the invention.

[0011] FIG. 4 shows a front view of an example of a surface-treatment pad having surface levels disposed at least two different elevations according to the invention.

[0012] FIG. 5 shows a side view of an example of a surface-treatment pad having surface levels disposed at least two different elevations according to the invention.

[0013] FIG. 6 shows a perspective view of example of a surface-treatment pad having surface levels disposed at least two different elevations according to the invention.

[0014] FIG. 7 shows a front view of an example of a surface-treatment pad having surface levels disposed at least two different elevations according to the invention.

[0015] FIG. 8 shows a side view of an example of a surface-treatment pad having surface levels disposed at least two different elevations according to the invention.

[0016] FIG. 9 shows a rear view of an example of a surface-treatment pad according to the invention.

[0017] FIG. 10 shows a front view of an example of a surface-treatment pad according to the invention using a fibrous material for the working pad.

[0018] FIG. 11 shows a rear view of an example of a surface-treatment pad according to the invention using a fibrous material for the working pad.

DETAILED DESCRIPTION OF THE INVENTION

[0019] Applicant now describes in detail embodiments of the claimed invention. The described embodiments are examples. This detailed description is not intended to limit the scope of the invention as claimed.

[0020] FIG. 1 shows an example of a system according to the claimed invention. In FIG. 1, surface-treatment pad 10 has: working pad 20 with central aperture 22 and front surface 24; insert 18 with threaded central aperture 19; first carrier layer 14A disposed between the rear surface of working pad 20 and said insert 18; first affixing layer 16A disposed between said first carrier layer 14A and said rear surface of said working pad 20; and second affixing layer 16B disposed between said insert 18 and said first carrier layer 14A so as to fix said insert 18 to said first carrier layer 14A. Surface-treatment pad 10 further has: second carrier layer 14B disposed upon the side of said insert 18 opposite said working pad 20; and third affixing layer 16C disposed between said second carrier layer 14B and said insert 18.

Insert 18 has apertures 18A passing therethrough to allow
for material from second affixing layer 16B and third affixing layer 16C to pass therethrough to secure said insert 18 to said first carrier layer 14A and said second carrier layer 14B. Spacer 12 is a short piece of tubing sized to fit on a driveshaft of a drive device between surface-treatment pad 10 and the body of the conventional drive device. In FIG. 2, surface-treatment pad 110 is substantially identical to surface-treatment pad 100, except that working pad 120 lacks a central aperture.

[0021] In the embodiments shown in FIGS. 1 and 2, working pad 20 is polyurethane foam; however, any strong, flexible, compressible foam material may be used. Open-cell polymeric foam is preferred. In addition, working pad 20 may be formed from a plurality of natural or artificial fibers as are known in the art of surface treatment, including heavy wool fibers as shown in FIGS. 10 and 11.

[0022] In FIG. 1, insert 18 is a flexible disc with central aperture 19 having internal threads allowing for attachment to a drive system. Any strong and light material capable of supporting workable threads for attachment to a drive system may be used—for example, aluminum or plastic—may be used to make insert 18. Insert 18 has a plurality of apertures 18A for allowing material to pass therethrough, as described above.

[0023] Carrier layers 14A and 14B are portions of fabric that allow affixing layers 16A, 16B, and 16C on which to take hold. Affixing layers 14A and 14B are layers of adhesives or other substances that bind carrier layers to each other or to working pad 20 or insert 19. In this embodiment, carrier layers 14A and 14B are made from fabric; but any other material capable of holding adhesive and not otherwise unsuited to the application may be used, including for example fabric, plastic, paper.

[0024] In one example of a method of manufacturing the surface-treatment pad, a working pad 20, insert 18, and the carrier layers 16A, 16B, and 16C are stacked along with affixing layers 14A and 14B in the sequence shown in the drawings. Affixing layers 14A and 14B are hot-melt adhesive. The stacked layers are then heated by a hot press so that affixing layers pass through apertures 18A of insert 19 and upon cooling bind the various layers and components of the device together. The carrier layers 16A, 16B, and 16C, together with insert 18 and affixing layers 14A and 14B, form a drive assembly affixed to working pad 22. The drive assembly allows the surface-treatment pad to retain much greater flexibility across the pad surface than is ordinarily achieved with a foam pad mounted to a conventional backing plate.

[0025] In certain embodiment, the working surface of the surface-treatment pad may have surface levels disposed at least two different elevations with respect to the insert 18. Bulling-pad surfaces having grooves, protrusions, or apertures are known in the art; a few particular examples are shown in FIGS. 3 through 11.

What is claimed is:

1. An article of manufacture, comprising:
   a working pad, said working pad having a generally planar front surface and a generally planar rear surface, and said working pad being a portion of polishing material selected from one of the following classes of materials: open-cell foam and absorbent natural padding;
   an insert affixed to said rear surface of said working pad, said insert having a front surface facing said front surface of said working pad and a rear surface facing said rear surface of said working pad, and said insert having a coupling disposed in the center thereof for engaging a corresponding coupling of a drive shaft of a driving device, and said insert being formed from flexible material;
   a first carrier layer disposed between said rear surface of said working pad and said insert;
   a first affixing layer disposed between said carrier layer and said rear surface of said working pad;
   a second affixing layer disposed between said insert and said first carrier layer so as to fix said insert to said first carrier layer;
   a second carrier layer disposed upon the side of said insert opposite said working pad;
   a third affixing layer disposed between said second carrier layer and said insert wherein said insert has an aperture passing therethrough to allow for material to pass therethrough to secure said insert to one or more of said first carrier layer and said second carrier layer.

2. An article of manufacture according to claim 1, wherein at least one of said first carrier layer and said second carrier layer covers an area of the rear surface of the working pad equal to about 50 to 90 percent of the area of the rear surface of the working pad.

3. An article of manufacture according to claim 1 wherein at least one of said first carrier layer and said second carrier layer covers an area of the rear surface of the working pad equal to about 50 to 90 percent of the area of the front surface of the working pad.

4. An article of manufacture according to claim 1, wherein said insert is constructed from one of the following materials: aluminum and plastic.

5. An article of manufacture according to claim 1, wherein said insert has a threaded coupling.

6. An article of manufacture according to claim 5, wherein said insert is a threaded coupling having between one and three internal threads.

7. An article of manufacture according to claim 1, wherein said first carrier layer is made of fabric and said second carrier layer is made of fabric.

8. An article of manufacture according to claim 1, wherein first affixing layer is a hot-melt adhesive and said second affixing layer is a hot-melt adhesive and said third affixing layer is a hot-melt adhesive.

9. An article of manufacture according to claim 1, wherein first affixing layer is a hot-melt adhesive and said second affixing layer is a hot-melt adhesive and said third affixing layer is a hot-melt adhesive.

10. An article of manufacture according to claim 1, wherein said working surface of said surface-treatment pad has surface levels disposed at least two different elevations with respect to said insert.

11. An article of manufacture according to claim 1, wherein said working surface of said surface-treatment pad has surface levels disposed at least two different elevations with respect to said insert.

12. An article of manufacture according to claim 1, wherein said working surface has an outer edge, said outer edge of said working having one of the following edge profiles: beveled, rounded, curved, or down up edges.

13. An article of manufacture according to claim 1, wherein said second carrier layer is formed of fabric, adhesive, paper, or plastic.

14. An article of manufacture according to claim 1, wherein said article of manufacture weights less than about 15 grams per square inch of working surface nominal area, computed based upon the diameter of the working surface.
15. A system for treating a surface, comprising:
a surface-treatment pad, said surface-treatment pad being
an article of manufacture according to claim 1; and
a spacer for placing onto said drive shaft, said spacer
being a generally tubular member adapted to maintain
spacing between said drive device and said surface-
treatment pad.

16. A system according to claim 15, wherein said spacer
has a threaded coupling for coupling to a threaded coupling
of said drive shaft.

17. A method for treating a surface, comprising:
providing a system according to claim 15;
placing said spacer upon said drive shaft of said drive
motor so that said spacer is positioned to maintain
spacing between said surface-treatment pad and said
drive motor;
coupling said surface-treatment pad to said drive shaft by
means of said threaded coupling of said surface-treatment pad and said threaded coupling of said drive shaft;
driving said surface-treatment pad in rotational motion by
means of said drive shaft;
placing the working surface of said surface-treatment pad
in contact with a surface to be treated.

18. A method according to claim 17, further comprising:
applying polish, wax, compound, or glaze to said working
surface of said surface-treatment pad.

19. A method according to claim 17, further comprising:
applying polish, wax, compound, or glaze to said surface
to be treated.