ABRASIVE FINISHING ARTICLE ASSEMBLY

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ABSTRACT

An assembly wherein a quick-coupling support member is disposed between a rotary sander pad and a finishing disk. The support member is formed on one side with a hub for releasable engagement with the sander pad and is adhesively secured on the other side to the rear side of the finishing disk.

10 Claims, 4 Drawing Figures
ABRASIVE FINISHING ARTICLE ASSEMBLY

FIELD OF THE INVENTION

The field of art to which the invention pertains includes the field of finishing, more particularly with respect to abrasive finishing articles and supporting members therefor.

BACKGROUND AND SUMMARY OF THE INVENTION

Sander pads are commonly constructed so that a finishing disk of paper or the like having finishing material on one side can be adhesively secured to the front surface of the pad. Such pads are configured to provide rearwardly with a hub including a shaft for engagement with a driving tool. The front surface of the pad is formed generally flat and textured for better adherence to the paper back of the finishing disk. In order to better conform the pad to an irregular surface, it is often constructed with a flat, relatively thick circular disk of resilient foam, such as urethane foam, sandwiched between more durable material constituting the front surface and a disk of relatively stiff material constituting the back surface. Adhesive is applied to the front surface, back of the finishing disk, or both, and the disk is adhered to the pad. When it is desired to change finishing disks, as a result of the disk being worn, or to progress to a finer finishing material, the finishing disk is peeled from the front surface of the pad, adhesive is again applied and then a new finishing disk is adhesively secured to the pad. These operations are not only time consuming, but as a result of the temperatures generated in the sanding operation and the repeated peeling away of the finishing disks, the front surface of the sander pad tends to deteriorate and eventually reaches a point where the sander pad itself, a relatively expensive item, must be replaced.

One solution which has been proposed to overcome the time-consuming problem of adhesively binding the finishing disk to the pad is to incorporate a locking mechanism directly onto the rear surface of the finishing disk so as to couple the disk directly to the pad. Such a quickcoupling construction eliminates the need for stripping of the finishing disks from the pad and therefore preserves the integrity of the pad surface so that this item has a substantially longer useful lifetime. Such a disk is illustrated in application Ser. No. 806,250, filed Mar. 11, 1969, by J. H. MacKay, Jr., having common assignment with this application, now U.S. Pat. No. 3,667,170. A drawback is the substantially greater cost when compared to simple paper disks.

It is desirable therefore to provide a device which allows the quick-coupling and decoupling of a finishing disk but which can utilize simple paper finishing disks of the common, inexpensive type.

The present invention provides a finishing device which utilizes simple finishing disks, but which allows for their ready coupling to and decoupling from the support pad. This is accomplished by providing a quick-coupling intermediate support member between the finishing disk and the support pad. In particular, the support member carries a locking hub on its rear surface and has a front surface formed for adhesive coupling to the rear surface of a simple finishing disk. The hub is adhesively secured to the support member and extends outwardly to releasably couple with a mating component on the sander pad.

A plurality of quick-coupling support members can be utilized, each having a finishing disk adhesively secured to its front surface. One support member carrying a finishing disk can then be quickly connected to the sander pad and then quickly disconnected when it is desired to use a fresh or different grit finishing disk carried by another support member. At a later, more convenient time, the used finishing disks can be peeled from the support members and new finishing disks adhesively applied. Each support member can thus be reused and can be constructed so as to have as long and as useful a lifetime as the integral sander pads presently utilized. However, rather than replacing an entire sander pad when the support surface has been deteriorated, the support member only need be replaced. Importantly, the cost of a support member is many times less than the cost of a typical prior art integral sander pad. There is thus provided a finishing device assembly which is more economical in use than the present assembles and which further provides a quick-coupling capability not provided by the present devices.

Referring to specific structure, the quick-coupling support member has a front surface advantageously formed of a material selected from cloth, plastic, rubber, metal, or combinations thereof. For example, the support member can be formed of two continuous circular layers of cloth laminated together into an integral firm structure having opposite, substantially parallel front and rear surfaces. The hub is adhesively secured axially to the rear surface of the support member to extend outwardly thereof. In a particular embodiment, the hub comprises a hollow boss formed with an annular lip defining a central opening, the lip being curved inwardly to define an internal single screw thread. The boss is rotatably engageable with a corresponding stud on the sander pad, the stud having an external screw thread formed for insertion within the boss and surrounded by a core member defining a surface thereabout for abutment against the hub.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a finishing device assembly including a sander pad, intermediate quick-coupling support member coupled to the sander pad and an abrasive finishing disk adhesively secured to the front surface of the support member;

FIG. 2 is a perspective view of a sander pad, a quick-coupling support member and an abrasive finishing article, in disassembled position;

FIG. 3 is a perspective, exploded view of a sander pad and three support members, the sander pad being disconnected and the support members each having a different abrasive finishing disk adhesively secured thereto; and

FIG. 4 is a cross-sectional partial view of the assembled sander pad, support member and abrasive finishing disk illustrated in FIG. 1, taken about the line 4—4 thereof in the direction of the arrows.

DETAILED DESCRIPTION

Referring to FIG. 1, there is illustrated a finishing device assembly 10 comprising an abrasive finishing disk 12 having finishing material 14 on its front surface and having its rear surface adhesively secured to a quick-coupling support member 16 which, in turn, is coupled
to a sander pad 18, which will be described in more detail hereinafter. A spindle or shaft 20 extends axially rearwardly from the sander pad 18 and is adapted to engage a power drive tool (not shown) such as a pneumatic or electric motor, or the like, for purposes of rotating the finishing device assembly 10.

Referring to FIG. 2, components of the finishing device assembly are shown in more detail. The finishing disk 12 comprises a circular sheet of paper 22 or the like having abrasive particles of finishing material prereadhered to its front surface and presenting a relatively smooth rear surface. The quick-coupling support member 16 is also of circular configuration of substantially the same diameter as the finishing disk 12 and is formed relatively thin, compared to the sander pad 18. The support member 16 in this illustration is formed of two layers of cloth laminated together into an integral firm structure having opposite, substantially parallel front 24 and rear 26 surfaces. The support member 16 could also be constructed of plastic, rubber, metal, rubberized cloth, or combinations of these materials, but should have, even when metal, some flexibility.

The front surface 24 of the support member 16 is formed to be adhesively secured to the rear surface 22 of the finishing disk 12 and adhesive 28 is schematically shown to illustrate this adhesion and the fact that the finishing disk 12 can be subsequently stripped from the support member 16.

The support member 16 carries a hub or drive member 30 axially central on its rear surface 26 and secured thereto by adhesive 32 (FIG. 4). The hub 30 comprises an annular flat metal member or flange 34 having a deformed central portion defining a hollow boss 36. The hub 30 is constructed of a metallic material, such as cold rolled steel and is formed from a disk as by stamping or the like. With additional reference to FIG. 4, the boss 36 is open at its outer end and has a lip 38 curved inwardly, broken at 40 and formed so as to define an internal screw thread. In place of the hub 30 as above-described, one can utilize any coupling configuration as known to the art in conjunction with a mating coupling component carried by the sander pad 18.

The sander pad 18 includes a circular backing member 42 of rigid plastic material or the like to which is adhesively secured a relatively thick, flat circular pad 44 formed of resilient material. The pad 44 can be formed of foam rubber or polyurethane, or an equivalent foam material which has an internal cell structure. The perimeter of the pad can be coated with a skin of plastic so as to seal the outer surface of the pad 44 against the entry of water or similar materials. A circular sheet 46 of reinforcing material, formed of a heavy material such as canvass, leather, burlap, rubberized fabric, or the like is applied to the front surface of the pad 44 with adhesive, or the reinforcing sheet 46 can be embedded in the face of the pad 44 during molding of the pad 44. A central portion of the reinforcing member 46 and pad 44 is cut away to define an aperture 48 for accommodating the sander pad coupling component 50 which will be described in more detail hereinafter. The coupling component 50 is configured to matingly engage the support member boss 36 and is provided with a threaded stud 52 which threadably engages the boss lip 38 to rotatably interconnect with the hub 30. The stud 52 extends through the pad 44 and continues through the backing member 42 rearwardly of the sander pad 18 as the spindle 20.

Referring now to FIG. 3, an exploded view of the finishing device assembly 10 is illustrated adjacent an additional pair of pre-adhered support member-finishing disk assemblies 54 and 56. In operation, adhesive indicated at 28 is applied to the rear surface of the finishing disk or bottom surface of the support member, or both, and the finishing disk 12 is thereby secured to the bottom surface of the support member 16. Alternatively, one could utilize finishing disks precoated with pressure sensitive adhesive so that the finishing disk could simply be thrust onto the front surface of the support member 16. It is an important advantage of the present invention, as illustrated in FIG. 3, that a plurality of finishing disks such as 12, 12' and 12" can be adhesively pre-secured to a plurality of support members, such as 16, 16' and 16", respectively, so that during a sanding operation, one need not pause to strip and reaply new finishing disks, but can merely rapidly disengage the support pad 16 and rapidly engage a different support pad 16' carrying a fresh finishing disk 12'.

Referring to FIG. 4, there is illustrated in cross-section details of construction of the various components. The backing member 42 of the sander pad 18 is molded of a resilient plastic but which is relatively rigid compared to the pad 44, and formed with a central pocket 58 into which is press fit the coupling component 50. The coupling component 50 is formed in one piece of a core 60 snugly fit into the pocket 58 and formed rearwardly with the threaded spindle 20. The spindle 20 extends through an axial aperture 62 in the backing member 42 and is rigidly secured by a washer 64 and nut 66 to the backing member 42.

The front of the coupling member 50 is formed with an axial stud 52 which is threaded for engagement with the lip 38 of the support member boss 36. The core 60 continues forwardly to form a hollow cylindrical member 68 annularly about the stud 52, the bottom surface of which engages the hub flange 34 when the stud is threaded into the boss 36.

The pad 44 is secured on one side by adhesive 70 to the backing member 42 so that its central aperture 48 exposes the backing member pocket 58. The reinforcing member 46 is secured by adhesive 72 to the front of the pad 44. The core 60 can be inserted before or after such assembly of backing member and pad.

The hub flange 34 secured by adhesive 32 onto the rear surface 26 of the support member 16 and, as a result, a small space 74 is defined between the sander pad and support member, which space is closed immediately during use. The finishing disk 12 is shown secured to the front side of the support member by a layer of adhesive 28.

As required, details of an illustrative embodiment of the invention have been disclosed. However, it is to be understood that this embodiment merely exemplifies the invention which may take forms different from the specific illustrative embodiment disclosed. Therefore, specific structural and functional details are not necessarily to be interpreted as limiting, but as a basis for the claims.

I claim

1. A finishing device assembly, for use with a finishing disk, comprising:
a rotary sander pad having a rear backing member and a front surface and a layer therebetween formed of flat resilient material, said backing member being bonded to the rear surface of said layer
of resilient material and being formed of material which is rigid compared to said layer of resilient material, said sander pad being formed rearwardly to engage a driving tool; a quick-coupling support member for connecting to the front surface of said sander pad, said support member being substantially thinner than said layer of resilient material and having a front, outer surface defined by continuous material for adhesive connection to the rear surface of a finishing disk, and coupling members releasably engageable to alternately connect and disconnect said sander pad and support member, said support member being freely separable from said sander pad when said coupling members are disconnected.

2. The invention according to claim 1 in which said support member is formed of at least two layers of cloth laminated together into an integral firm structure having opposite, substantially parallel front and rear surfaces.

3. The invention according to claim 1 in which said coupling members are formed for rotatable engagement.

4. The invention according to claim 1 in which said coupling members comprise a hub permanently affixed to the rear surface of support member to extend outwardly therefrom and an axial component on said sander pad releasably engageable with said hub.

5. The invention according to claim 4 in which said hub comprises a hollow boss formed with an annular lip spaced from the rear surface of said support member and defining a central opening, said lip being curved inwardly to define an internal single screw thread, and said sander pad axial component comprises a stud having an external screw thread formed for insertion within said boss and a core member defining a surface about said stud for abutment against said hub.

6. The invention according to claim 1 including a finishing disk having front and rear surfaces and finishing material on its front surface, the rear surface of said finishing disk being adhesively securable to the front surface of said support member.

7. The invention according to claim 1 wherein said continuous material is cloth.

8. The invention according to claim 1 wherein said continuous material is plastic.

9. The invention according to claim 1 wherein said continuous material is rubber.

10. The invention according to claim 1 wherein said continuous material is metal.

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