May 5, 1942. G. E. SMITH 2,281,722

SANDING OR POLISHING PAD

Filed Nov. 20, 1939

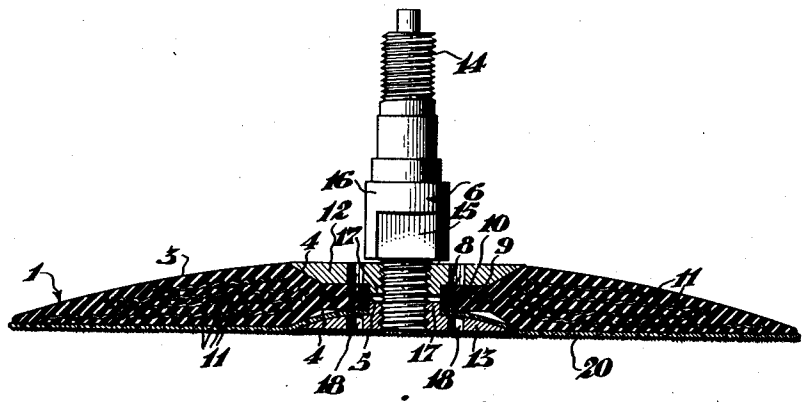

Fig. 1

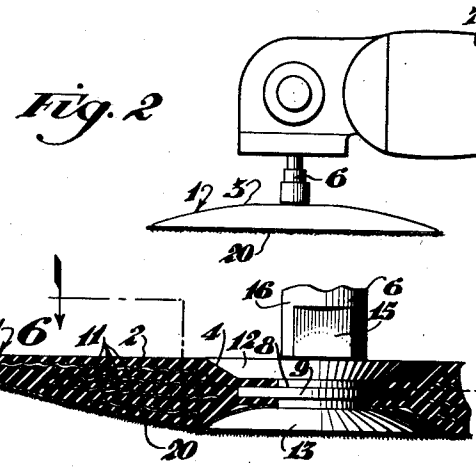

Fig. 2

Fig. 3

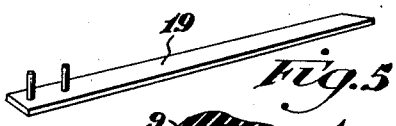

Fig. 5

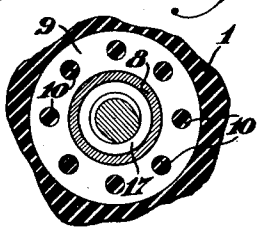

Fig. 6

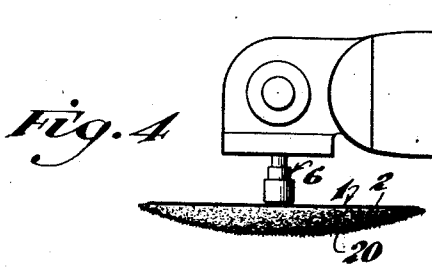

Fig. 4

INVENTOR.

BY George E. Smith

Word & Word ATTORNEYS

Patented May 5, 1942

2,281,722

UNITED STATES PATENT OFFICE

2,281,722

SANDING OR POLISHING PAD

George E. Smith, Cincinnati, Ohio, assignor to The United States Electrical Tool Company, Cincinnati, Ohio, a corporation of Ohio

Application November 20, 1939, Serial No. 305,287

2 Claims. (Cl. 51—197)

This invention relates to the art of treating, as for example, polishing the surfaces of metal and other material by means of a portable power driven appliance. In this type of device, a rotary pad is supported on the drive shaft of the motor. The abrasive sheet or disc is secured upon the surface of the pad and the device, thus assembled, is used to engage the abrasive sheet on the surface to be treated. The prior art discloses rubber pads.

Heretofore, the supporting rotary pads used on sanders or polishers for the backing of emery cloth, sand paper discs or polishing cloths, as stated, have been made from rubber, or have been made from metal. They have been provided with a slightly convex surface to prevent the abrasive disc from gouging into the work and also for facilitating the cutting action of the disc. Additionally, they have been constructed relatively rigid. This prevents the disc from working effectively into sunken portions of flat surfaces, as are usually found in automobile bodies and similar parts being prepared for refinishing and painting.

It has been the object of this inventor to provide a pad of semi-flexible material, rigid enough to support an abrasive disc or polishing sheet while under working pressure during the surface treating operation, yet which is so constructed and formed as to provide for either the treatment of flat surfaces or for the treatment of uneven surfaces having depressions and concavities of varying contour. Accordingly, the invention takes form in a pad structure which has a flat surface on one side and a convex surface on the other, and which is conveniently detachable and reversible on the driving shaft.

Now in the construction of a rubber disc, it is necessary to provide for a positive connection to the drive shaft and it is not enough to provide clamping discs attached to the drive shaft and screwed together on the pad. For this reason, it has been a further object of the inventor to provide a metal insert which is, in fact, molded and bound into the center of the pad and which constitutes a metal hub upon which the driving discs may be clamped.

It is a further object of the inventor to provide a pad which is conveniently reversible and which is firmly mounted on the drive shaft in either position.

Other objects and certain advantages will be more fully apparent from a description of the accompanying drawing, in which:

Figure 1 is a cross-sectional view taken on a diametric line through the pad.

Figure 2 is a side elevation of the pad and a typical motor unit for driving the pad with the flat face of the pad, supporting the polishing media for use on a flat surface.

Figure 3 is a cross-sectional view illustrating the pad in position with the curved face supporting the polishing media.

Figure 4 is a view similar to Figure 2 but showing the pad reversed.

Figure 5 is a perspective view of a spanner wrench to be used to tighten the nuts which hold the polishing media in place on the pad.

Figure 6 is a cross-sectional view taken on line 6—6, Figure 3.

The flexible pad, indicated generally at 1, is a disc-like structure. Its one face 2, is substantially flat while its other face 3 is rounded. The rounded face curves convexly from a thicker center of the pad to a thinner edge.

In both faces of the pad, the central areas are countersunk at 4; the edges of both countersunk areas being beveled, while the bottoms of the countersunk areas are substantially flat. A hole 5 in the center of the pad, and consequently in the center of the two countersunk areas, serves as a point of attachment for the pad. The pad is attached to a spindle 6, which is driven by an electric motor 7.

The point of attachment is reinforced by a hub 8, which carries a flange 9 extending outwardly radially from its circumference medially of its length. The hub and flange are molded into the pad; both ends of the hub being flush with both surfaces of the countersunk areas while both faces of the flange are covered with substantial thicknesses of material. The flange has a plurality of holes drilled through it, so that the material of the pad fills the holes to join together, through the holes the material on both sides of the flange. Thus the rubber in the holes constitutes dowels or pins 10.

In the preferred embodiment of my invention the disc is formed of rubber. Circular reinforcing sheets 11 of heavy cloth may be cast into the rubber to give it additional strength against splitting or cutting. The reinforcements also aid substantially to retain the shape of the pad when it is spinning during a polishing operation.

The spindle 6 has a threaded portion at its extended end and the pad is secured thereon by two relatively thin nuts 12 and 13. The nuts sandwich the pad between them so that the lower nut, when tightened, acts as a lock nut.

The spindle may be separable from the motor housing to facilitate changing of the pad. As shown in Figure 1, the spindle also has threads 14 at its upper end to screw into a threaded socket in the drive shaft (not shown) in the motor housing. To facilitate turning of the spindle to loosen it from the drive shaft, flattened portions 15 are provided in a shoulder 16 on the spindle. One of the nuts, conforms to the countersunk portions in the faces of the disc. For this purpose, it is beveled at its edge and flat on its inner face contacting the bottom of the countersink. Nut 12 is the uppermost of the two. The other nut 13 is slightly thinner and is rounded on its inner face. Both nuts are provided with circular lugs 17—17 which extend into the opening 5 of the hub 8 when the nuts are in place. A pair of holes 18—18 is provided in both nuts for the insertion of the pair of pins of a spanner wrench 19 to turn the nuts.

Nut 13 may also serve to hold the polishing media in position on the pad. A circular sheet 20 carrying sand or other abrasive, cloth, rouge or some other commercial material may be used. In this instance, the sheet is provided with a center aperture to fit around the threaded end of the spindle. The sheet is positioned between the pad and lock nut 13.

The pad and polishing sheet are attached to the spindle by the following steps: (1) The nut 12 is screwed onto the spindle. (2) The pad is then placed on the spindle with the appropriate face of the disc down. (3) The polish sheet is then placed in position on the bottom face of the pad. (4) Nut 13 is screwed tightly onto the spindle to lock the unit in place. The threading of the spindle preferably is opposed to the torque of the motor so that the nuts will not become loosened during a polishing operation.

As shown in Figure 1, the lower nut 13 is thin enough so that when it is positioned, locking the polishing media to the pad, it does not extend beyond the line of the polishing media to mar the surface being worked upon.

A draw string polish sheet may be used. In this instance the lower nut is in direct contact with the bottom of the hub 8 and is covered by the sheet.

The construction of the disc is extremely effective for rigidly, mechanically connecting the pad with the driving shaft. The rubber mounted through the openings, as stated, forms dowels or pins which are effective in the transmission of the rotatable power to the pad and for securing the pad against radial displacement which may be caused by centrifugal force. The surfaces of the pad serve as frictional driving means for the abrasive disc due to the attachment by the circular metal discs or nuts 12 and 13 by means of which the whole assembly is secured to the driving spindle.

When the abrasive disc is secured to the flat surface, it is used for smoothing or cutting flat surfaces, as for example, floors, refrigerator barrels, etc. When it is secured to the convex side, it is used for smoothing or polishing uneven surfaces, as for example, feather edging automobile bodies, fenders, etc.

Having described my invention, I claim:

1. A support pad for a surface treatment disc, comprising a circular rubber element having a central bore and providing a flat side and a convex side, a metal hub molded in the central bore of the element, providing an apertured flange with the rubber molded through the apertures, and a pair of attaching nuts adapted to engage upon opposite sides of the element, said element including counter-sunk portions for receiving said nuts.

2. A support pad for a surface treatment disc, comprising a circular rubber element having a central bore, a metal hub molded in the central bore of the element, providing an apertured flange with the rubber molded through the apertures, and a pair of attaching nuts adapted to engage upon opposite sides of the element, said element including counter-sunk portions for receiving said nuts.

GEORGE E. SMITH.