Aug. 30, 1949. A. F. PIMENTEL 2,480,508

ABRASIVE SHEET HOLDING SANDING DISK

Filed April 14, 1947

Fig. 1.

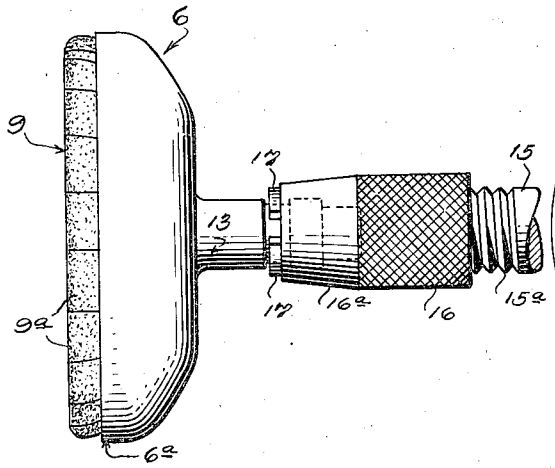


Fig. 2.

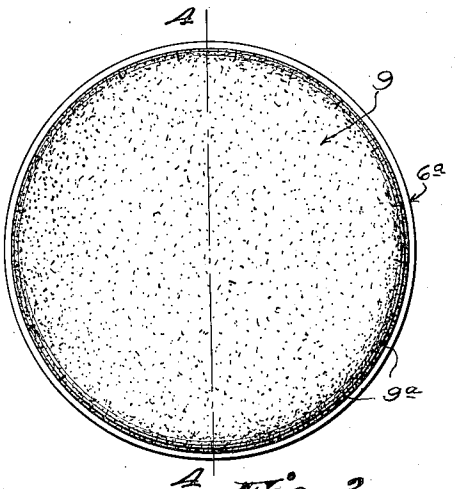


Fig. 3.

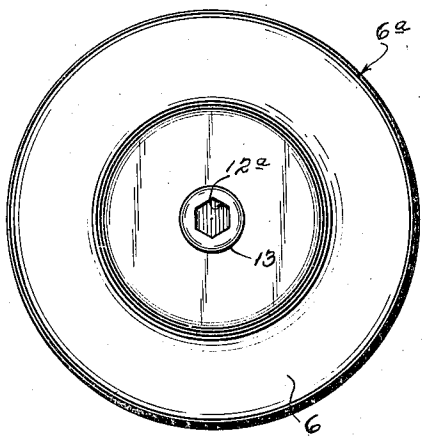


Fig. 4.

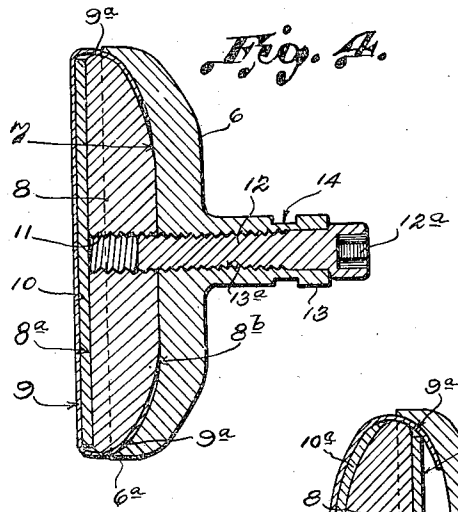
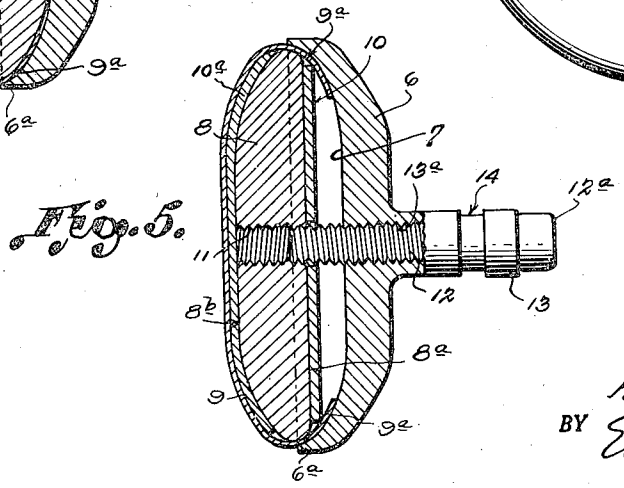


Fig. 5.



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ABRASIVE SHEET HOLDING SANDING DISK

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Application April 14, 1947, Serial No. 741,345

11 Claims. (Cl. 51—197)

1

My invention relates to improvements in buffers, surface sanders, polishers, and the like, with particular reference to such as are mechanically driven, and at high speeds, although not necessarily restricted thereto.

In the case of a high speed sander, for instance, the usually thin surface-engaging sanding disk or the like has been secured to the rotary head by clamp means including a laterally protruding portion. This makes the device dangerous to the hands of the operator when in use, and also the presence of these laterally extending clamp portions makes it impossible to closely approach walls or raised portions adjacent the surface being worked upon. Also, prior art devices of this class afford no protection for the upturned sides of the emery or other surface-engaging sheet which is clamped to the head.

It is, therefore, the primary object of my invention to overcome the objections hereinabove noted, by the provision of novel and improved head-associated clamping means for a sand disk or other work-engaging surfacing, which means is free of laterally projecting protuberances so as to not only avoid likelihood of injury to the operator, but also to assure against the marring of adjacent raised surfaces; and, finally, to protect against wearing or tearing of the sides of the disk at and adjacent the point of attachment to the head when the device is in use.

Also, the invention provides a securing means for a replaceable work engaging head-surfacing which enables said surfacing to be readily applied or removed from the head with a minimum of time expenditure, and without the exercise of any particular skill.

Another object of the invention is to furnish a device as characterized having a novel head including a removable backing element for a sand disk or the like, said disk-backing element presenting a plane surface at one face for use when it is desired to sand a floor or other plane surface; and the opposite face of said removable head element providing a curved surface so as to facilitate polishing or sanding variously curved objects, such as bowls, chair rockers, and the like.

Additionally, the invention contemplates a buffer or the like which involves a minimum number of very simple parts, which are strong, and durable, and inexpensive to manufacture, in that

2

they may be readily fabricated in quantity in a number of ways from a wide variety of products, such as wood, plastic, or metal. This latter matter of material that may be used is of particular moment when lightness in weight is a factor, as is frequently the case.

The foregoing and other objects of the invention will be readily understood and appreciated by those skilled in the art upon reference to the accompanying drawing in connection with the detailed description of the now preferred embodiment of the invention appearing hereinafter.

Although one example of the invention has been illustrated in accordance with the requirements of the Patent Statutes, it will be understood that my inventive concept is susceptible of other mechanical expressions within the spirit and scope of the subject matter claimed hereinafter.

In the drawing, wherein the same reference characters have been used to designate the same parts throughout the several views,

Fig. 1 is a side elevational view of a buffer, sander, or the like, embodying my invention, the same being illustrated as carried by a conventional drive shaft-carried chuck;

Fig. 2 is a bottom elevational view of the device illustrated in Fig. 1;

Fig. 3 is a top plan view;

Fig. 4 is a cross-sectional view taken on the line 4—4 of Fig. 2 showing the plane surface of the removable head element presented toward the work; and

Fig. 5 is a cross-sectional view similar to Fig. 4, but showing the removable head-carried element reversed, as when a curved surface is to be worked upon.

Referring to the drawing by reference characters, numeral 6 designates a bowl-like head element having the marginal flange 6*a* which is circular, and surrounds the circular concaved recess 7. This recess 7 is adapted to at least partially receive the removable block-like disk 8 which constitutes the carrier or backing for the sand disk or other polishing surfacing 9.

In Fig. 4, the sand disk 9 is disposed upon the felt or other slightly compressible disk 10 against the plane surface 8*a* of the head disk 8 as when a plane surface is to be worked upon. However, in Fig. 5 the head disk 8 is shown reversed, so as

to present curved surface 8b to the sand disk or the like 9. In this latter instance, a concavo-convex compressible disk 10a is disposed between sand disk 9 and the convexly curved surface 8b of head disk 8.

Figs. 2 and 4 best illustrate that the sanding or other disk 9 has laterally spaced segmental edge cut-outs so that a series of intermediate tongues 9a will be provided to be reverted rearwardly in edge to edge relationship about the edge of head disk 8. These tongues 9a are clamped against the rear surface of head disk 8 by means of the concave marginal portion of the bowl member 6 in a manner to be now described.

In carrying out the invention, I provide the removable head disk 8 and the bowl element 6 of the head with aligned concentric tapped holes 11, 13a, for reception of a clamp screw or bolt, 12. When this screw or bolt 12 is tightened up, it will be obvious that the head disk 8 will be drawn tightly into the recess 7 of the bowl element 6 of the head, thus clamping the reverted tongue portions 9a of the sanding disk 9 between the head disk 8 and said bowl member 6.

Reference to Figs. 4 and 5 indicates that the circumferential flange 6a of the bowl member 6 of the head overlies the side of the removable head disk 8, so as to protect an adjacent elevated surface from the action of the sand or other disk 9. Also, said head bowl flange 6a protects the sand disk 9 itself, and especially the tongue portions 9a thereof from a cutting or ripping action, as in the case of the device being brought too close to a sharp metal surface.

The securing bolt 12 has the hexagonally or other recessed head 12a for the reception of a correspondingly formed wrench element designed to loosen or tighten said bolt when the sand disk, polisher or the like 9, is to be removed or installed.

The tapped hole 13a of the bowl element 6 of the head extends out through the integral and concentric tubular shank 13 which is received in the chuck, as indicated in Fig. 1.

The illustrated chuck is conventional, being carried by the driven shaft 15, having the threaded portion 15a adjacent its inner end. This threaded shaft portion 15a carries the exteriorly knurled collar 16, having the tapered forward end which acts upon clamp jaws 17 in the usual manner for bringing the inturned outer jaw ends into clamping engagement with the annular groove 14 of the tubular stem 13, as indicated in Fig. 1.

As will be obvious, the device comprises really but three strong, durable, easily manufactured parts, namely, the driven head bowl element, the removable block-like backing disk 8 for the sanding or polishing surfacing 9, and the clamp screw 12 for holding the aforementioned parts assembled. The compressible backing disk 10 interposed between the removable head 8 and the sanding disk 9 is a very useful and advantageous adjunct to the parts just mentioned, and since it takes up shock in use of the tool, it will substantially extend the life of the sanding or polishing surface element 9.

When the curved surface 8b of member 8 is disposed toward the work, as in Fig. 5, the plane compressible disk 10 may be housed in the recess 7 of member 6, as indicated. And the same is true as to the concavo-convex disk 10a when the plane surface 8a is disposed toward the work as in Fig. 4.

It is also important to note that head recess 7 being concaved, provides an endless inwardly bevelled clamping surface to efficiently compress and hold the sand disk tabs 9a against the block edge (Figs. 4 and 5) regardless which block face (8a or 8b) is directed toward said recess 7.

The essential parts of the device may obviously be made out of wood, metal, or plastic, and may be molded, stamped, or turned, depending upon the materials used, thus rendering the device very inexpensive to make, and very light in weight if desired.

Having thus described my invention, what I claim is:

1. A device of the class described comprising in combination, a manipulatable head having a recess in one face, a marginal skirt surrounding said recess, a block-like element shaped to conform to said recess and of a size to snugly fit in same, said block-like element being of a widthwise size in all directions less than the correrecess and providing an outwardly disposed back-like element being partially projectable into said recess and providing an outwardly disposed backing surface for a work engaging surfacing, a replaceable work engaging sheet dimensioned oversize with respect to said block-like element at least at points approximately opposite one another and whereby said opposed portions will overlie opposite edges of the block-like element, and one of said skirt and block-like element having an inwardly bevelled surface engaging the other whereby to clamp the block-edge overlapping portions of said sheet therebetween, said skirt terminating short of the plane of sheet-backing surface of said block-like element, and protecting the marginal portions of said block-like element and sheet, and means operatively engageable with the head and block-like element for drawing the two together.

2. A device of the class described comprising in combination, a manipulatable head having a recess in one face, a marginal skirt surrounding said recess, a block-like element partially projectable into said recess and providing opposite head-recess-receiving faces differently profiled and selectively available as a backing for a work-engaging surfacing, a replaceable work-engaging sheet dimensioned oversize with respect to said block-like element at least at points approximately opposite one another and whereby said opposed portions will overlie opposite edges of the block-like element, and one of said skirt and block-like element having an inwardly bevelled surface engaging the other whereby to clamp the block-edge overlapping portions of said sheet therebetween, said skirt terminating short of the plane of sheet-backing surface of said block-like element, and protecting the marginal portions of said block-like element and sheet, and means operatively engageable with the head and block-like element for drawing the two together.

3. A device of the class described comprising in combination, a manipulatable head having a recess in one face, a marginal skirt surrounding said recess, a block-like element shaped to conform to said recess and of a size to snugly fit in same, said block-like element being of a widthwise size in all directions less than the corresponding exterior size of said head, said block-like element being partially projectable into said recess and providing an outwardly disposed backing surface for a work-engaging surfacing, a replaceable work-engaging sheet dimensioned oversize with respect to said block-like element at least at points approximately opposite one another and whereby said opposed portions will overlie opposite edges of the block-like element, and one of

said skirt and block-like element having an inwardly bevelled surface engaging the other whereby to clamp the block-edge overlapping portions of said sheet therebetween, said skirt terminating short of the plane of sheet-backing surface of said block-like element, and protecting the marginal portions of said block-like element and sheet, a compressible pad interposed between said sheet and its block-element-provided backing surface, and means operatively engageable with the head and block-like element for drawing the two together.

4. A device of the class described comprising in combination, a manipulatable head having a recess in one face, a marginal skirt surrounding said recess, a block-like element partially projectable into said recess and providing opposite head-recess-receiving faces differently profiled and selectively available as a backing for a work-engaging surfacing, a replaceable work-engaging sheet dimensioned oversize with respect to said block-like element at least at points approximately opposite one another and whereby said opposed portions will overlie opposite edges of the block-like element, and one of said skirt and block-like element having an inwardly bevelled surface engaging the other whereby to clamp the block-edge overlapping portions of said sheet therebetween, said skirt terminating short of the plane of sheet-backing surface of said block-like element, and protecting the marginal portions of said block-like element and sheet, a compressible pad interposed between said sheet and its block-element-provided backing surface, and means operatively engageable with the head and block-like element for drawing the two together.

5. A device of the class described comprising in combination, a rotatably driven disk-form head having a recess in one face, a circular marginal skirt surrounding said recess, a block-like disk element shaped to conform to said recess and of a size to snugly fit in same, said block-like element being of a widthwise size in all directions less than the corresponding exterior size of said head, said block-like element being partially projectable into said recess and providing an outwardly disposed backing surface for a work-engaging surface, a replaceable disk-form work-engaging sheet dimensioned oversize with respect to said block-like element whereby to overlie the edges of the block-like element, and one of said skirt and block-like element having an inwardy bevelled surface engaging the other whereby to clamp the block-edge overlapping portions of said sheet therebetween, said skirt terminating short of the plane of sheet-backing surface of said block-like element, and protecting the marginal portions of said block-like element and sheet, and means operatively engageable with the head and block-like element for drawing the two together.

6. A device of the class described comprising in combination, a rotatably driven disk-form head having a recess in one face, a circular marginal skirt surrounding said recess, a block-like disk element shaped to conform to said recess and of a size to snugly fit in same, said block-like element being of a widthwise size in all directions less than the corresponding exterior size of said head, said block-like element being partially projectable into said recess and providing an outwardly disposed backing surface for a work-engaging surfacing, a replaceable disk-form work-engaging sheet dimensioned oversize with respect to said

block-like element whereby to overlie the edges of the block-like element, and one of said skirt and block-like element having an inwardly bevelled surface engaging the other whereby to clamp the block-edge overlapping portions of said sheet therebetween, said skirt terminating short of the plane of sheet-backing surface of said block-like element, and protecting the marginal portions of said block-like element and sheet, and bolt means operatively engageable with the head and block-like element for drawing the two together,.

7. A device of the class described comprising in combination, a rotatably driven disk-form head having a recess in one face, a circular marginal skirt surrounding said recess, a block-like disk element partially projectable into said recess and providing opposite head-recess-received faces differently profiled and selectively available as a backing for a work-engaging surfacing, a replaceable disk-form work-engaging sheet dimensioned oversize with respect to said block-like element whereby to overlie the edges of the block-like element, and one of said skirt and block-like element having an inwardly bevelled surface engaging the other whereby to clamp the block-edge overlapping portions of said sheet therebetween, said skirt terminating short of the plane of sheet-backing surface of said block-like element, and protecting the marginal portions of said block-like element and sheet, and means operatively engageable with the head and block-like element for drawing the two together.

8. The combination set forth in claim 4, and a compressible pad for each of said sheet-backing surfaces of the block-like element, and said head recess adapted to house at least one of said pads when it is not in use.

9. The combination set forth in claim 1, and a concentric attaching post extending from the face of said head member opposite its recessed face.

10. The combination set forth in claim 6, said head element having a chuck-engaging post concentrically projecting from the face opposite its recessed face, and said bolt means working in said post.

11. The combination set forth in claim 1, and said means for drawing the block and head together comprising a single bolt, said block having a tapped hole in which said bolt takes, a sleeve carried by the back of said head and receiving said bolt, and the outer end of said bolt terminating in a shoulder engaging the outer end of said sleeve whereby the latter provides a thrust bearing for said bolt.

ARTHUR F. PIMENTEL.

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