Dec. 15, 1942. G. A. ELLESTAD 2,305,340

FLEXIBLE ABRADING PAD

Filed Dec. 30, 1939 2 Sheets-Sheet 1

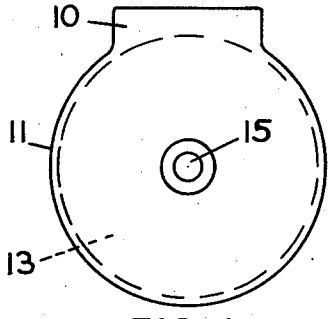


FIG. 1

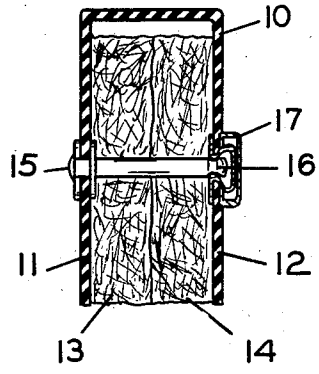


FIG. 2

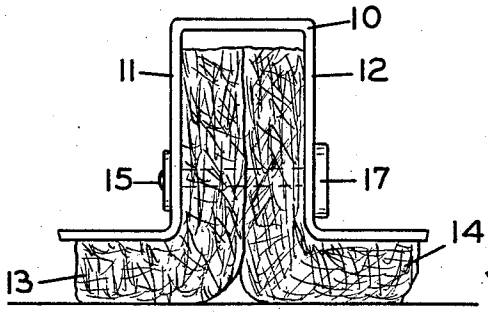


FIG. 3

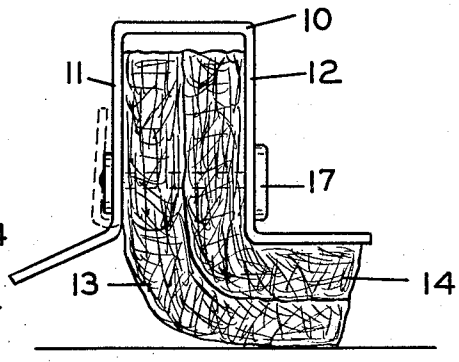


FIG. 4

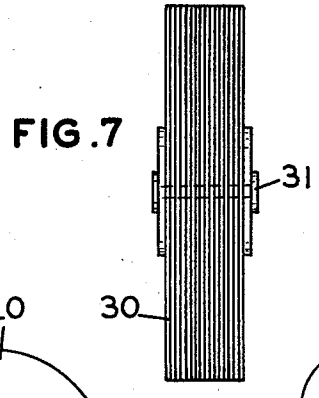


FIG. 7

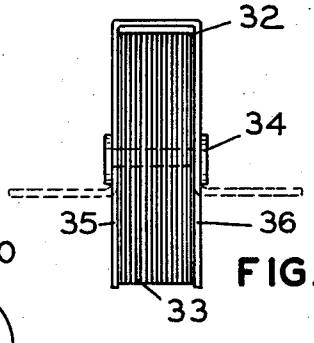


FIG. 8

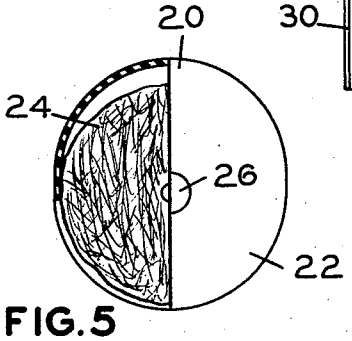


FIG. 5

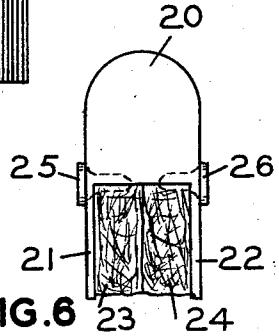


FIG. 6

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Dec. 15, 1942. G. A. ELLESTAD 2,305,340

FLEXIBLE ABRADING PAD

Filed Dec. 30, 1939 2 Sheets-Sheet 2

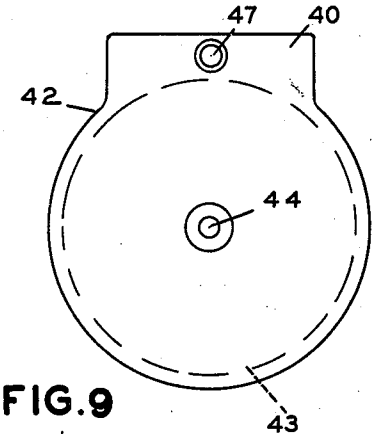


FIG. 9

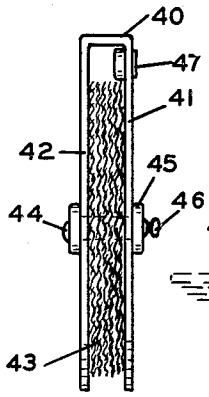


FIG. 10

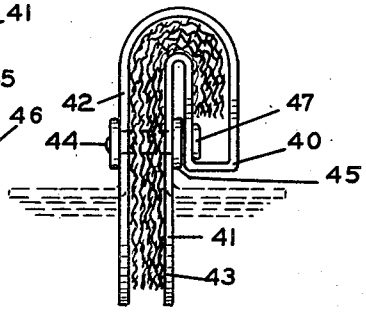


FIG. 11

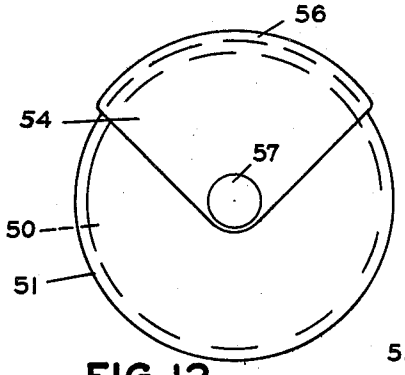


FIG. 12

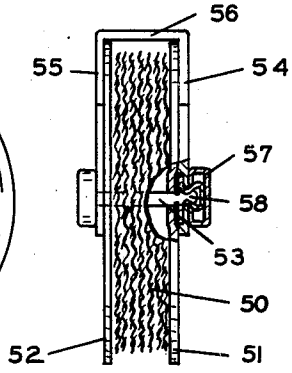


FIG. 13

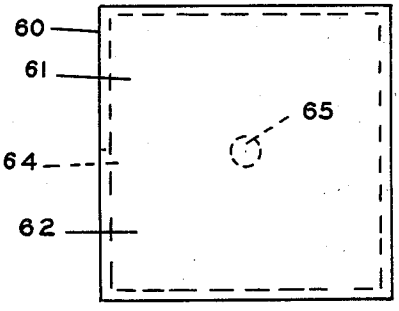


FIG. 14

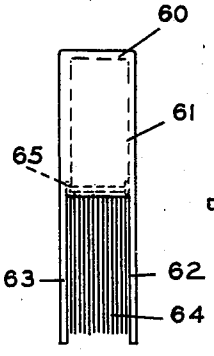


FIG. 15

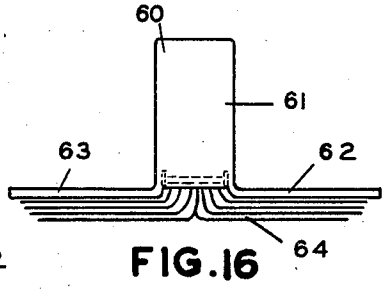


FIG. 16

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UNITED STATES PATENT OFFICE

2,305,340

FLEXIBLE ABRADING PAD

Gerhard A. Ellestad, Rochester, N. Y.

Application December 30, 1939, Serial No. 311,841

5 Claims. (Cl. 51—187)

This invention relates to abrading methods and devices such as are used in the household or shop for polishing, scouring, cleaning, rubbing down or smoothing wood work, furniture, automobile bodies, kitchen utensils or the like. Throughout the specification and claims the term "abrading" is used in a broad sense to indicate any and all of the above-mentioned operations so that the term will include the polishing of furniture, the sand papering of wood, the scouring and cleaning of kitchen utensils and similar operations.

One of the objects of my invention is to provide an improved abrading method which will be efficient in operation. Another object is to provide an improved abrading device of the character described which will be simple in structure yet convenient and efficient in use. Another object is to provide an abrading device having a holder for the abrading material which will protect the user's hands from the material while still permitting it to be gripped naturally and used efficiently. A further object is to provide an abrading device having laminations of flexible abrading material arranged so that a portion of the assembled laminations may be gripped while other portions are used in abrading operations. Still another object is to provide a holder for abrading material which will make it possible to utilize all of the abrading material to the best advantage and with a minimum of waste. These and other objects and advantages reside in certain novel features of construction, arrangement and combination of parts and in the method of abrading as will hereinafter be more fully described and pointed out in the appended claims.

This application is a continuation-in-part of my co-pending application Serial No. 196,406 filed on March 17, 1938.

Referring to the drawings:

Fig. 1 is a front view of an abrading device embodying my invention.

Fig. 2 is a vertical sectional view of same.

Figs. 3 and 4 are views illustrating the methods of using my device.

Fig. 5 is a front view of a modification with parts in section.

Fig. 6 is a side view of same.

Figs. 7 and 8 are views of further modifications.

Fig. 9 is a front view of another modification.

Fig. 10 is a side view of same.

Fig. 11 is a similar view showing the upper part of the device folded over.

Fig. 12 is a front view of still another modification.

Fig. 13 is a side view of same.

Fig. 14 is a front view of a further modification.

Fig. 15 is a side view of same.

Fig. 16 is a view illustrating the method of using the device of Figs. 14 and 15.

One embodiment of my invention is illustrated in the drawings wherein I have shown one form of abrading device having a U-shaped holder 10 which may be formed integrally or of a plurality of pieces of flexible sheet material such as rubber, water-proofed fabric, cellulosic sheeting or the like. The holder 10 preferably has a somewhat circular shape and has the two spaced sides 11 and 12 between which are mounted a plurality of circular layers or laminations of abrading material 13 and 14 which may be formed of steel wool, woven metal fabric, or any other flexible abrading material. Secured substantially at the center of side 11 is a post 15 which passes freely through central openings in the abrading layers 13 and 14. The free end of post 15 carries a stud 16 which cooperates with a snap fastener 17 secured to side 12 so that the abrading elements 13 and 14 are rotatably mounted and detachably secured to the holder and hence may be readily renewed.

In operating the device, the two lower adjacent portions of abrading layers 13 and 14 are separated and flexed into opposite directions so that the two contiguous portions provide a substantially continuous abrading surface as shown in Fig. 3. The upper portions of the layers may be gripped naturally and easily by the hand together with the flexible holder 10 so that the device may be readily manipulated. Since the holder and abrading material are flexible, the device may be used efficiently for scouring flat or irregular surfaces and the corner portions of pots and pans. The flexible sides 11 and 12 provide protection for the hands. When the lower portions of the abrading layers 13 and 14 become worn and matted, the layers are turned about the post 15 so as to bring new unused portions into position where they may be flexed and used. The outer side of each abrading element 13 and 14 may also be flexed and used in the manner illustrated in Fig. 4. From the foregoing, it will be apparent that the abrading layers 13 and 14 may be used to good advantage and with a minimum of waste since substantially all of the abrading surfaces of elements 13 and 14 may be utilized.

In the modification shown in Figs. 5 and 6 the upper part of holder 20 is in the form of a pocket with the two spaced sides 21 and 22 projecting outwardly from the mouth of the pocket. The two abrading elements 23 and 24, such as steel wool pads of substantially circular shape, are held within the pocket by means of the tapered pins 25 and 26 which extend inwardly into the elements 23 and 24 from the respective sides 21 and 22. The holder 20 is preferably formed integrally of molded rubber or the like so that the sides 21 and 22 may be flexed and the device used in the same manner as illustrated in Figs. 3 and 4. With this type of holder, it will be apparent that the hand of the operator will be more fully protected than in the case of the holder shown in Figs. 1 and 2. The tapered pins 25 and 26 are riveted or otherwise secured to the respective sides 21 and 22. The abrading elements or pads may be readily changed by merely spreading apart the sides 21 and 22 so that the pins are freed from the abrading elements. The abrading pads 23 and 24 may be turned about the pins 25 and 26 so as to selectively bring unused portions of the pads into position for use, thereby enabling the operator to use substantially all of the abrading surfaces of the pads, in the same manner as the device of Figs. 1 and 2 is used.

In the modifications shown in Figs. 7 and 8 I have shown adaptations of my invention for the purpose of holding abrasive sheet material such as sand paper or the like. The device of Fig. 7 comprises an assemblage of sheets of sand paper 30 which are preferably of circular form and are held together by a rivet 31 passing through the centers thereof. The sheets of sand paper 30 are preferably coated with abrasive on both sides so that abrasive areas are in face to face contact. Any two adjacent sheets may thus be flexed substantially at the center so that the flexed portions extend in opposite directions, just as in the case of the steel wool pads of Fig. 3. The upper portion of the assemblage of sheets will thus afford a convenient handle for holding the assemblage while using the flexed portions for an abrading operation. The modification of Fig. 8 is of a similar construction except that a protecting holder or cover 32 is employed to partially enclose the assemblage of sand paper sheets 33. The holder 32 is held in place by the rivet 34 which passes through the centers of the sheets 33. The holder 32 may be formed of flexible sheet material such as rubber or fabric or it may be formed of bendable sheet metal. The holder 32 serves to protect the hands of the operator and aids in providing an efficient gripping means.

Sand paper for household use is generally sold in packages containing about fifteen or twenty sheets each approximately 4 x 5 inches in area. In using a sheet of sand paper, it is usually desirable to place it around a block of wood so as to afford ample gripping means for manipulating the sheet. Suitable blocks for such purposes are not always conveniently available so that the sand papering operation cannot always be done efficiently. Sand paper sheets may, however, be assembled and sold in packages or assemblages as shown in Figs. 7 and 8 and since the assemblage of sheets provides a handle or gripping means, a block of wood or like is not required for efficient operation of the sand paper in such packages. In case the holder 32 is formed of bendable sheet metal, the device would be sold with the sides 35 and 36 of the holder in parallel relation with the sheets 33. The user would then bend the sides to dotted line position so that the holder would provide a relatively firm broad backing support for the sheets which are flexed into operative position. The grit on the faces of all sheets may be of the same fineness or various degrees of grit fineness may be provided by using different grits on the sheets. It will be understood, of course, that the grits of the abrading faces which are in contact with each other will have the same fineness so that when the two contacting portions are separated and flexed into position, the operative exposed abrading surface will be uniform in character.

The modification shown in Figs. 9–11 comprises a U-shaped holder 40 formed of flexible sheet material such as rubber, water-proofed or coated fabric, cellulosic sheeting or the like. The holder 40 preferably has a somewhat circular shape and includes the two spaced sides 41 and 42 between which are mounted a plurality of superposed pieces or disks of cloth 43 of circular shape. The disks 43 may be formed of any suitable material such as cotton flannel, felt, paper, parchment or the like and such disks may be chemically treated or impregnated with polishing substances so as to render the disks suitable for dusting and polishing furniture, automobile bodies and the like or the disks may be chemically treated so as to make them useful for polishing silverware and other metallic articles.

Secured substantially at the center of side 42, by riveting or other suitable means, is the post 44 which passes freely through central holes in cloth disks 43. The central part of side 41 carries a snap fastener 45 which cooperates with the free end of post 44, as in the form shown in Figs. 1 and 2. It will thus be apparent that the cloth abrading disks 43 are rotatably mounted between the sides 41 and 42 and detachably secured so that they may be readily removed from the holder 40 and replaced by new disks.

In operation, the abrading disks 43 and sides 41 and 42 are flexed into diverging relationship as in the use of the device in Fig. 3. When the cloth disks 43 are to be used for polishing furniture or the like they should have a diameter of about 6 inches so as to provide an abrading or polishing area of ample size. However, when the abrading disks 43 are of such size, the upper half of the holder 40 does not afford a very stable or convenient means for gripping the device for use. This disadvantage can be overcome by reversely folding the upper half of the holder 40 and disks 43 as shown in Fig. 11. The holder may be selectively retained in such folded-over relation by means of a stud 46 which is carried by snap 45 and cooperates with snap fastener 47 secured at the upper edge of side 41. Other suitable fastening means could be provided for retaining the upper half of holder 40 in folded-over relation. Thus the stud 46 could be secured directly to side 41, or a hook and eye arrangement could be substituted for the snap fastener. The abrading device shown in Figs. 9–11 is especially useful for wiping and polishing automobile bodies, furniture or the like. For such purposes, the disks 43 may be formed of cloth or paper which is treated with oil or other polishing substances. The holder 40 is formed of sheet material which is water proof and oil proof so the hands of the user will be protected against soiling or contamination.

In the modification shown in Figs. 12–13, an

assemblage of circular, superposed disks or layers 50 of flexible abrading material is positioned between two circular cover members 51 and 52 formed of flexible sheet material, the whole being held firmly together by a centrally disposed post or rivet 53. The assemblage is mounted to rotate between the sides 54 and 55 of the sectoral U-shaped holder 56 and this is accomplished by providing snap fasteners 57 on the respective sides 54 and 55 which engage studs 58 carried at the outer ends of post 53. By this structure, the assemblage of abrading disks 50 is rotatably mounted within holder 56 so that the disks may be brought into abrading position for use in the manner shown in Fig. 3. The holder 56 is detachably secured to the assemblage of disks 50 so that a new unit of disks 50 may be substituted for those that become worn out. The disks 50 may be made of fabric, paper or other suitable flexible material and the disks may be treated with polishing or detergent substances. The holder 56 is made of any suitable flexible sheet material such as coated or waterproofed fabric or the like so as to afford protection to the hands of the user during abrading operations.

In the modification shown in Figs. 14–16 the holder 60, formed of flexible sheet material such as coated fabric, rubber or the like, has a pocket portion 61 which occupies substantially the upper half of the holder and has the two spaced sides 62 and 63 extending downwardly from the mouth of the pocket portion. An assemblage of superposed sheets or laminations of abrading material 64 is held together by centrally disposed holding means such as a rivet or post 65. The holder 60 and the sheets 64 preferably have a rectangular shape and the size of sheets 64 is such that the pocket 61 will snugly receive and hold substantially one-half of the assemblage of sheets 64. In use, the sides 62 and 63 and the sheets 64 are flexed in diverging relationship into a plane for abrading action, as clearly shown in Fig. 16. When one-half of the sheets become worn or soiled, the entire assemblage of sheets 64 is withdrawn from the pocket 61, turned through 180 degrees and the worn portions placed within pocket 61, thus leaving the other halves of the sheets 64 exposed for abrading use. The sheets 64 may be formed of cloth, paper, metallic fabric or other suitable flexible abrading material and such sheets may be chemically treated with any suitable polishing or detergent substances. The holder 60 will obviously protect the hands of the user against soiling or contamination from the abrading sheets.

From the foregoing it will be apparent that I have attained the objects of my invention and provided improved abrading methods and means which will be efficient and convenient in operation. Practically all of the abrading, scouring and polishing operations are carried on with the use of a polishing, cleaning or detergent agent and it is generally desirable to protect the operator's hands from contact with such agents. Or the abrading or scouring material such as steel wool, sand paper, metallic fabric or the like may be of such harsh, sharp character that it is desirable to protect the user's hands from contact therewith. In all of these cases, my improved holders will afford ample protection to the hands of the users.

Although the polishing of furniture or the like may not be regarded strictly as an abrading operation, I have used the term "abrading" in a broad sense throughout the specification and claims as including such operations as polishing furniture or the like, scouring or polishing metal ware, sanding or smoothing wood, metal or other material. The character of the abrading material to be used will depend upon the nature of the work to be done. Thus, oil polish treated cotton flannel, paper or the like would be used for polishing automobiles and furniture; chemically treated cloth would be used for polishing silverware or the like; steel wool, metal fabric or sand paper would be used for scouring, cleaning or smoothing such things as wood, kitchen utensils or the like. The holders will generally be made of a flexible sheet material such as coated fabric, rubber, cellulosic sheeting or the like which may preferably be water or oil proof. In the case of the sand paper holder of Fig. 8 the holder may be made of a bendable sheet metal. The holders 10, 20 or 40 may be formed of a relatively cheap water or oil proof material with the abrading laminations rotatably held by a simple post, pin, wire or stitching. In such case, the laminations of abrading material would not be removable since the entire holder and laminations would be discarded when the device was worn out.

Each modification of my device embodies a plurality of superposed layers or laminations of flexible abrading material in face to face contact held by centrally positioned means so that corresponding halves of two adjacent layers may be oppositely flexed into a substantially common plane to provide a relatively broad abrading surface while the unflexed portions afford hand gripping means. In the forms shown in Figs. 1–6 and 8–16 a holder is provided so as to afford protection for the hands during the abrading operations. Various modifications can obviously be made without departing from the spirit of my invention.

I claim:

1. An article of the type described comprising a substantially U-shaped holder made of flexible sheet material, and abrading means mounted between the sides of said holder, said means comprising a plurality of flexible abrading elements arranged in face to face contact, whereby said holder and elements may be separated to present an abrading surface, said means being rotatably mounted between the sides of said holder whereby different portions of said elements may be selectively presented for abrading action.

2. An abrading device comprising a U-shaped holder formed of flexible sheet material, and a plurality of superposed flexible abrading elements mounted between the sides of said holder whereby said holder and elements may be separated and flexed to provide an abrading surface, said elements being rotatably mounted between the sides of said holder whereby different portions of said elements may be selectively presented for abrading action and means on said holder for releasably retaining the unflexed part of said holder and elements in reversely folded relation so as to provide a handle which may be gripped when the device is used.

3. An abrading device comprising a holder formed of flexible sheet material and having a pocket portion with two side walls extending in spaced relation beyond the mouth of said pocket portion for a distance which is substantially the same as the depth of said pocket, and a pile of superposed substantially flat layers of flexible abrading material fitted snugly within and substantially filling said pocket and extending be-

yond said pocket so as to be substantially coextensive with the extensions of said side walls and means for holding said layers together only at their central portions whereby the extending parts of said layers and said side wall extensions may be separated and flexed substantially at their central portions so as to provide an abrading area.

4. An abrading device comprising a holder member made of sheet material and having two spaced side walls joined at their top portions, a plurality of superposed layers of abrading material positioned between said walls and being substantially coextensive therewith, said walls and abrading material being flexible whereby corresponding portions of two adjacent layers may be separated substantially at the central parts thereof and flexed into a substantially common plane for abrading action, and cooperating means at spaced points on the outer face of one of said walls for releasably holding the upper part of said wall and the adjacent portions of said layers in folded-over relation so as to afford handle means for the device.

5. An abrading device comprising a holder made of flexible sheet material and having a substantially U-shaped portion providing spaced side walls, a plurality of substantially flat layers of flexible abrading material mounted between said side walls, said layers being in face to face contact, and means for holding together only the central portions of said layers whereby corresponding adjacent portions of the layers may be separated and flexed with the walls at their central portions to provide an abrading surface, said layers being movably mounted within said holder whereby different portions of the layers may be selectively presented for abrading action.

GERHARD A. ELLESTAD.