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ABRADING, POLISHING, AND BUFFING DEVICE

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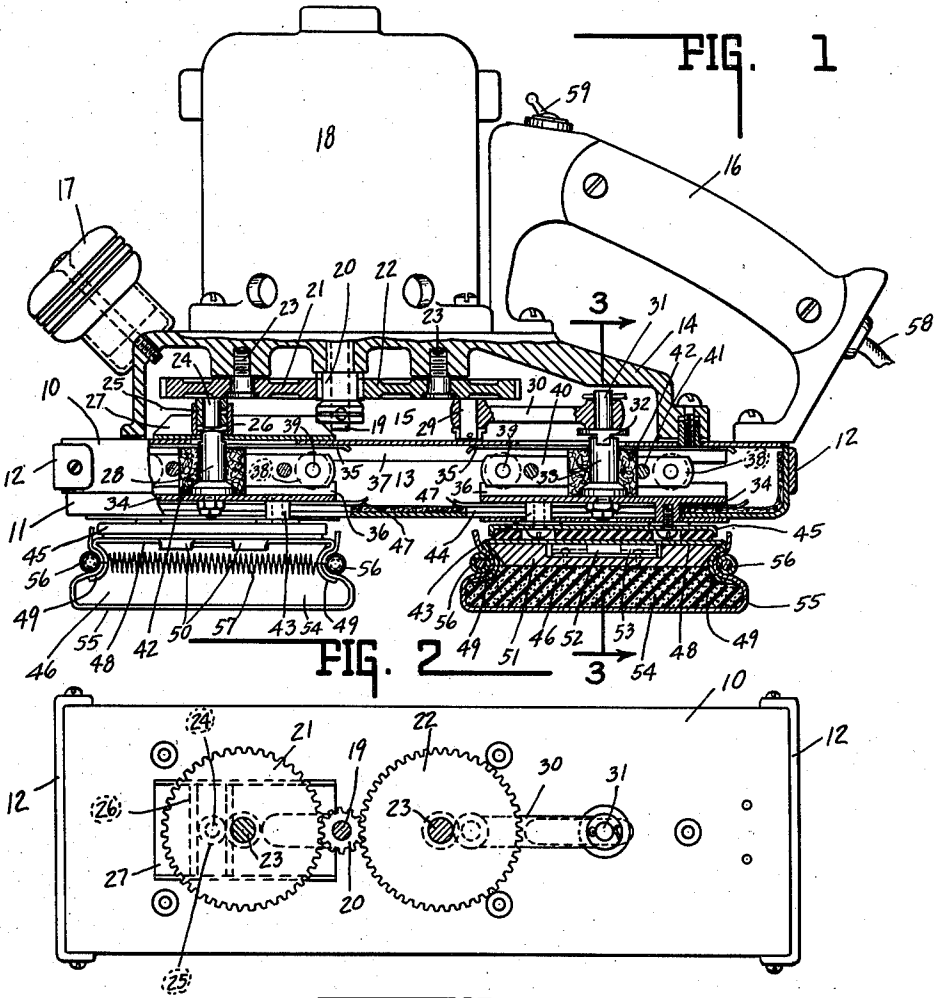


FIG. 2

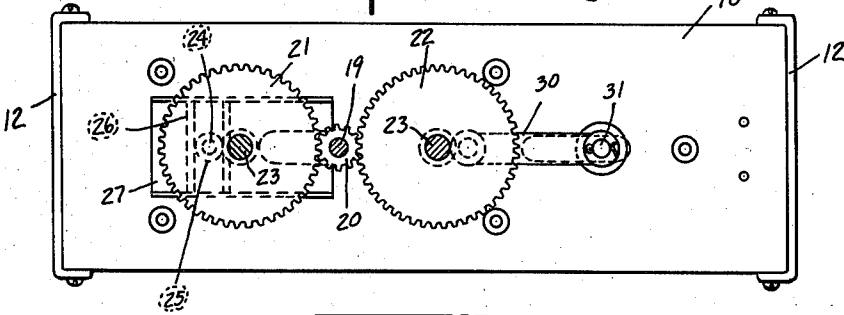
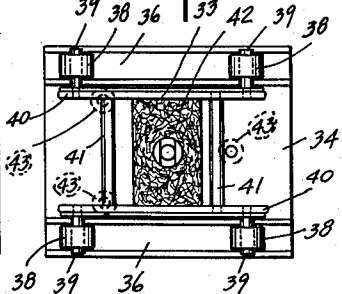
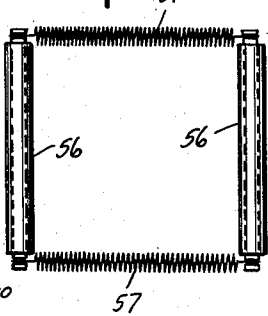
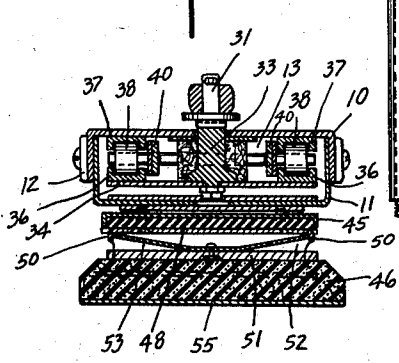


FIG. 5

FIG. 4

FIG. 3



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ABRADING, POLISHING, AND BUFFING DEVICE

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6 Claims. (Cl. 51—170)

This invention relates to an abrading, polishing and buffing device which is adapted to such widely varied uses as the sandpapering of floors, furniture and woodwork, the polishing of enamelled surfaces and the buffing of metallic surfaces requiring a high polish.

One object of the invention is to provide a device of this character which may be easily manipulated by hand and in which the internal friction, and hence the power required, and weight of the motor, is reduced to a minimum.

Another object is generally to improve upon the constructional details of devices of this character.

Other objects and features of the invention will be understood from the accompanying drawing and the following description and claims:

Fig. 1 is an elevational view with parts cut away and other parts shown in section of a preferred form of the invention. Fig. 2 is a plan view with parts removed and other parts shown in section. Fig. 3 is a vertical sectional view taken substantially on the line 3—3 of Fig. 1. Fig. 4 is a plan view of a reciprocating element and associated parts. Fig. 5 is a plan view of parts used for the attachment to the device of abrading or polishing elements.

In the preferred form of the invention shown in the drawing by way of illustration, the frame of the machine includes a box-like structure having an upper member 10, a lower member 11 and end members 12 suitably secured together to form an enclosed chamber 13. A casing 14 is secured to the top of the member 10 by suitable screws and forms a second enclosed chamber 15. A handle 16 secured to the top of casing 14 and to the member 10 serves for moving the device over a surface to be abraded or polished. A knob 17 secured to the casing 14 serves as a hand grip for guiding the device. A fractional horsepower electric motor 18 is mounted on the top of the casing 14 and drives a shaft 19 to which there is secured a pinion 20 meshing with gears 21 and 22, which are rotatably mounted on the undersurface of the casing 14 by means of pins 23. The gear 21 carries an eccentrically positioned crank pin 24 in turn carrying a roller 25. The roller 25 engages a channel shaped member 26 which is secured to a slidable member 27 resting upon the upper surface of the box member 10. The sliding member 27 and the channel member 26 are provided with non-circular openings engaging the non-circular end of a stud 28.

The gear 22 is provided with an eccentrically

positioned crank pin 29 which is connected by means of a link 30 to a pin 31. The pin 31 is provided with a tongue 32 engaging a groove in the upper end of a stud 33. Each of the studs 28 and 33 is secured to one of a pair of reciprocating members 34 within the box-like frame. Each of said studs projects through a suitable slotted opening in the member 10 and is thus free to reciprocate. A pair of plates 35 which are provided with openings closely fitting the studs 28 and 33 reciprocate with said studs and close the openings in the member 10 through which said studs project.

Each of the reciprocating members 34 carries on its upper surface a pair of channel-shaped guideways 36 and similar guideways 37 are carried by the undersurface of the box member 10. Anti-friction rollers 38 travel in said guideways and are carried by pins 39 supported in a frame consisting of longitudinal bars 40 and cross members 41. Each of the studs 28 and 33 is surrounded by a block 42 of soft rubber or other suitable material which is adapted to engage the cross member 41 and to prevent undesired over-travel of the rollers 38 and their associated frames. The undersurface of each of the reciprocating members 34 is provided with a plurality of bosses 43, preferably three in number, arranged as best seen in Fig. 4. Said bosses project downwardly through slotted openings 44 in the lower box member 11 and have secured thereto by means of suitable screws a pair of plates 45, each of said plates forming part of the base of a reciprocating working element indicated generally in the drawings by the reference number 46. The openings 44 are covered within the chamber 13 by plates 47 which are provided with suitable openings closely fitting the bosses 43 and, therefore, reciprocable therewith.

The base plates 45 have secured thereto, by suitable screws, base plates 48, said plates being formed as best seen in longitudinal section in Fig. 1 and in transverse section in Fig. 3. The ends of said plates terminate in downwardly extending portions 49 having an outwardly concave formation. The sides of said plates are provided with downwardly turned ears 50. The downwardly turned portions 49 of said plates form a guideway for a detachable dovetailed backing member 51 having a central recess 52 in which there is secured a leaf spring 53. The upper edges of the leaf spring engage the ears 50 and normally latch the dovetail piece 51 in the position shown in the drawing. However, by inserting a suitable tool between the ears 50 and

pressing one end of said spring downwardly, it may be freed from said ears and the dovetail member 51 may be withdrawn. Secured to the undersurface of the member 51 there is a mat 5 54 preferably formed of sponge rubber or other suitable material, depending upon the work to be done. About said mat there is trained a sheet 55 of whatever material is to be used in contact with the work. The sheet 55 may be sandpaper, 10 emery cloth, polishing cloth, chamols skin or other suitable material. The upper edges of said sheet engage the concavity in the members 49 and are retained therein by rollers 56, which are in turn resiliently held in place by tension springs 15 57 secured to the ends thereof. Because of the detachable construction of the backing member 51, several may be provided, each equipped with a different type of mat suitable for different classes of work. For some work, no mat is necessary, the backing member 51 being made sufficiently large to perform the function of the mat.

In the operation of the device, it is placed upon the surface of the article to be operated upon and the hands of the operator grasp the handle 25 16 and the knob 17. Power is supplied to the motor 18 from any suitable source of electricity by a flexible cable 58 and is controlled by a snap switch 59. When power is supplied to the motor 18, it rotates the shaft 19, pinion 20 and gears 30 21 and 22. By means of their crank pins and associated parts, said gears cause the reciprocation of the members 34 and the working members 46. This reciprocation alternately moves the members 46 toward and away from each other. 35 The weight of the device and the downward pressure supplied by the operator is transmitted from the box member 10 through the guideways 37, rollers 38 and guideways 36 to the reciprocating member 34 and thence through the bosses 43 to 40 the working members 46 and the sheet 55 of the working material. This weight or pressure, therefore, is transmitted through no sliding contact of any kind, the rollers 38 providing anti-friction transmission of the force from the relatively stationary 45 portion of the device to the reciprocating portions thereof. Since these rollers operate in a chamber which is closed in a substantially grease-proof manner by plates 45 and 47, an adequate supply of lubricating material may be 50 constantly maintained thereon. Aside from the small friction of the moving parts, the only power which need be supplied by the motor 18 is that necessary to overcome the friction of the working members 46 upon the work itself. The motor 55 may, therefore, be of relatively small power and correspondingly light weight. This construction results in a device which is easily transported and manipulated by the operator.

The foregoing specification describes a preferred form of the invention, the details of which may be varied within wide limits without departing from the scope thereof as defined by the appended claims.

The invention claimed is:

65 1. In a device of the class described, a box-like frame structure having openings in its upper and lower faces, a reciprocable member therein having parts projecting through said openings, power means connected to an upper projecting part for reciprocating said member, a working element 70 secured to at least one lower projecting part and reciprocable thereby, and rollable anti-friction

bearing members interposed between said reciprocating member and the upper wall of said frame structure.

2. In a device of the class described, a box-like frame structure having openings in its upper and lower faces, a reciprocable member therein having parts projecting through said openings, power means connected to an upper projecting part for reciprocating said member, a working element secured to at least one lower projecting part and reciprocable thereby, rollable anti-friction bearing members interposed between said reciprocating member and the upper wall of said frame structure, and guard members movable with said projecting parts and closing said openings to make a substantially grease-tight compartment within said frame. 15

3. In a device of the class described, a box-like frame structure having openings in its upper and lower faces and having a guideway on the inner side of its upper face, a reciprocable member therein having parts projecting through said openings and having a guideway on its upper surface, power means connected to an upper projecting part for reciprocating said member, a working element secured to at least one lower projecting part and reciprocable thereby, and rollable anti-friction bearing members interposed between said guideways. 20

4. In a device of the class described, a box-like frame structure having openings in its upper and lower faces, a pair of reciprocable members therein having projections extending through said openings, power means connected to an upper extension of each of said members and adapted to move the same alternately toward and away from each other, a working element secured to at least one of the lower projections of each of said members, and rollable anti-friction bearings interposed between said reciprocating members and the upper wall of said frame structure. 35

5. In a device of the class described, a box-like frame structure having openings in its upper and lower faces, a pair of reciprocable members therein having projections extending through said openings, power means connected to an upper extension of each of said members and adapted to move the same alternately toward and away from each other, a working element secured to at least one of the lower projections of each of said members, rollable anti-friction bearings interposed between said reciprocating members and the upper wall of said frame structure, and guard members movable with said projecting parts and closing said openings to make a substantially grease-tight compartment within said frame. 40 45 50 55

6. In a device of the class described, a box-like frame structure having openings in its upper and lower faces and having a guideway on the inner side of its upper face, a pair of reciprocable members therein having projections extending through said openings and each having a guideway on its upper surface, power means connected to an upper extension of each of said members and adapted to move the same alternately toward and away from each other, a working element secured to at least one of the lower projections of each of said members, and rollable anti-friction bearing members interposed between said guideways. 60 65 70

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