

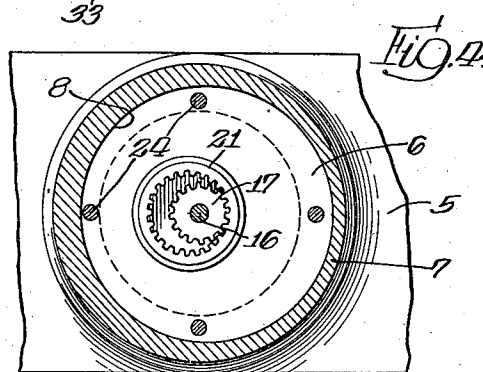
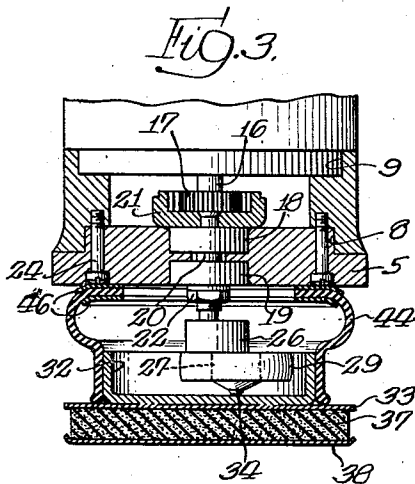
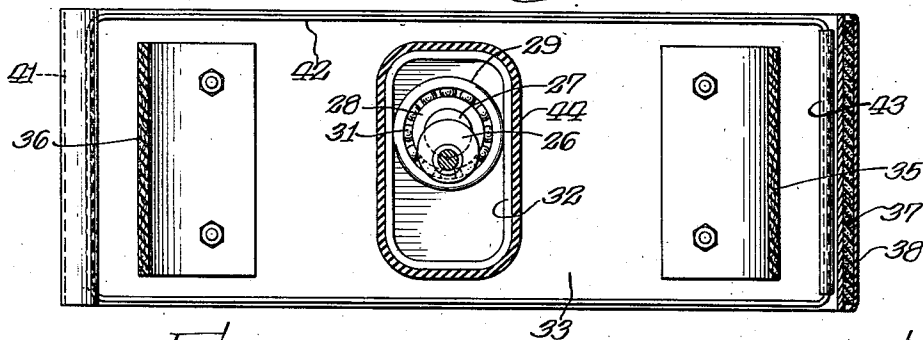
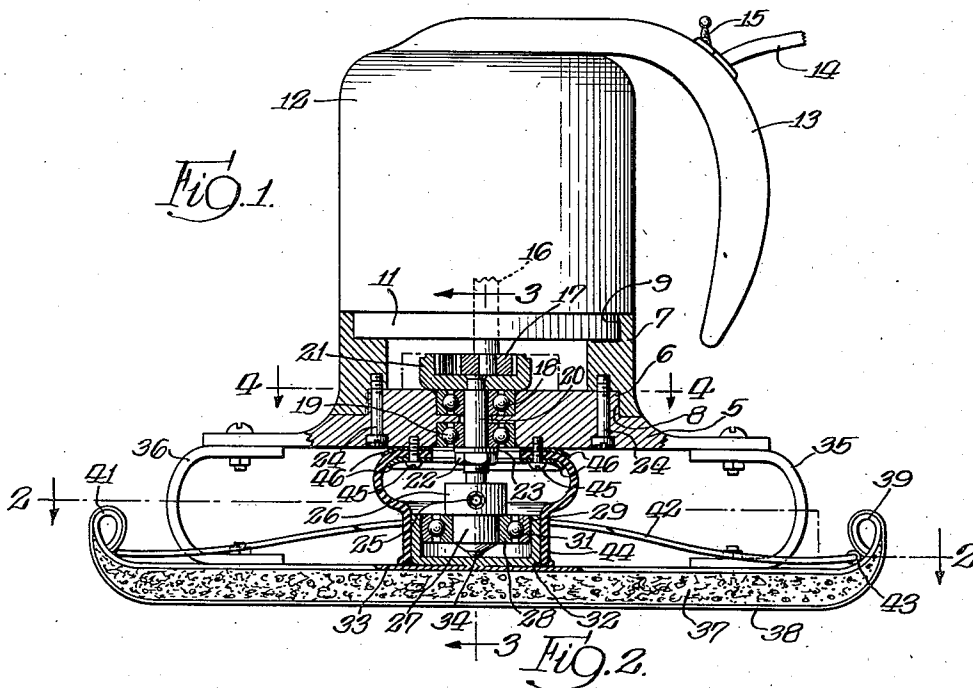
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2,193,419

PORTABLE SURFACING MACHINE

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PORTABLE SURFACING MACHINE

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8 Claims. (Cl. 51-170)

This invention pertains to surfacing machines of the portable type adapted for smoothing and finishing flat surfaces of wood or other material.

One of the purposes of my present invention is to provide a machine of this character having a speed reducing gearing between the electric motor and the surfacing pad which will enable a relatively small motor to be used without danger of stalling the same if the operator should apply more than the requisite or usual amount of pressure to the tool.

Another object is to provide a construction by which an accurate adjustment of the relative positions of the meshing gears may be attained by a simple adjustment made during the assembly of the apparatus and the provision of means for thereafter holding the gears against displacement from such adjusted position.

A further purpose is to provide a flexible connection of novel construction between the motor frame and the surfacing pad which will absorb vibrations and permit the pad to rest flatly upon the surface being treated irrespective of tilting movements of the motor frame.

Another feature of the invention resides in a construction which permits the direct application of any desired amount of pressure from the motor frame to the pad without interfering with the operation of the driving mechanism.

A further feature is found in the novel means employed for protecting the operating parts against grit particles and dust which cause rapid wear of the parts.

Still another feature of novelty resides in the structure by which the covering sheet for the pad is detachably secured in position.

Other objects and advantages of my invention will be readily appreciated as the same becomes better understood by reference to the following description when considered in connection with the accompanying drawing.

Referring to the drawing,

Fig. 1 is a vertical sectional view of a machine embodying my invention, the upper portion being shown in elevation;

Fig. 2 is a sectional view on the line 2-2 of Fig. 1;

Fig. 3 is a sectional view on the line 3-3 of Fig. 1; and

Fig. 4 is a sectional view on the line 4-4 of Fig. 1.

Referring to the drawing more in detail, reference character 5 indicates the motor base of the machine provided with an annular shoulder 6 over which rotatably fits an adjusting sleeve 7

provided at its lower end with an eccentrically disposed annular shoulder 8 surrounding the shoulder 6 and at its upper end with a concentric annular shoulder 9 surrounding the depending concentric annular shoulder 11 of the motor housing 12 in which an electric motor is mounted in the usual manner.

The motor housing is equipped with a handle 13 into which enters an electric cable 14 for supplying current to the motor under the control of a switch of any preferred construction operable by a knob or finger piece 15 located in convenient position.

The motor shaft 16 projecting beneath the motor case is equipped at its lower end with a driving pinion 17.

The upper face of the base 5 is recessed to accommodate a ball-bearing 18 and the lower face is similarly recessed to receive another ball-bearing 19, each bearing comprising the inner and outer races and interposed balls as is usual in bearings of this type. A shaft 20 journaled in these bearings has fixedly mounted upon its upper end an internal gear 21 adapted to mesh with the pinion 17 and has threaded upon its lower portion a nut 22 which, through an interposed washer 23, holds the bearings and shaft against displacement relatively to the motor base.

In order to insure proper driving relation between the pinion 17 and the gear 21, which will enable these gears to run quietly and without undue wear, relative adjustment between these gears is provided by the adjusting sleeve 7 previously described. When the parts are being assembled, the gear adjustment is effected by rotation of this sleeve. Since the recess in the upper end of the sleeve surrounding the shoulder 11 is concentric with the motor shaft and, therefore, with the pinion 17, and the recess in its lower end surrounding the shoulder 6 of the base 5 in which the shaft 20 carrying the internal gear 21 is mounted is eccentric to the motor shaft, rotation of the sleeve 7 between the motor and its base will move the base in a straight line relatively to the motor, thereby causing the gear 21 to approach or recede from pinion 17 until the requisite relative positions of these intermeshing parts is attained. The downwardly disposed shoulder of sleeve 7 is provided with a series of closely positioned tapped openings for the reception of the cap screws 24 extending through openings in the base 5. When proper adjustment of the gears has been secured, these cap screws are inserted and threaded home, thereby locking the base and sleeve together with the

gears in proper relation. The sleeve may be locked to the motor housing by any preferred means, such as one or more set screws (not shown) extending through the sleeve into engagement with the shoulder 11.

The lower end of shaft 20 has fixed thereto by a set screw 25, or otherwise, a crank arm 26 carrying a depending crank pin 27 upon which is snugly fitted the inner race 28 of a ball-bearing including the outer race 29 and the interposed balls 31. A transversely disposed open top guideway 32 is fixed to the pad plate 33 and proportioned to loosely receive the outer race 29, the perimeter of which is curved on a vertical arc so as to provide a line contact with the sides of the guideway and permit tilting movements of the motor relative to the pad plate without imposing strains upon the driving mechanism. The lower end 34 of the crank pin 27 is rounded as shown, and hardened to provide a thrust surface against the opposed hardened bottom wall of the guideway, so that downward pressure exerted upon the motor housing may be transmitted directly to the pad.

The pad plate is flexibly connected with the motor base through a pair of flexible U-shaped members 35 and 36 rigidly secured by bolts or otherwise to the pad and to the base. These members, preferably of fibrous composition, possess sufficient resiliency to normally support the weight of the motor with the thrust end 34 of the crank pin free from contact with the bottom of the guide member 32. The apparatus may be operated, therefore, merely with the weight of the motor applied to the pad, but if additional pressure is desired, as is customary, such pressure exerted by the operator is transmitted directly through the crank pin to the pad plate. The pressure thrust is, therefore, not transmitted to the pad through the flexible members 35 and 36, with the result that their resiliency and consequently rigidity is not increased and they are free to absorb the vibrations of the pad and prevent their transmission to the motor case.

This construction provides a smoother running machine and one freer from vibration than those in which pressure is applied to the pad through any flexible connection, the rigidity of which varies with the amount of pressure applied.

The pad itself, indicated by reference character 37, may be of any suitable resilient material attached to the plate 33, and the working face thereof is covered by a detachable covering such as sandpaper, emery cloth, or other fabric 38 which in the present instance is laid over the surface of the pad and its ends brought around the up-turned loops 39 and 41 of the plate. For the purpose of detachably holding the sheet 38 in position, I employ a rectangular holding member 42 formed of resilient wire provided at one end with a roller 43. In applying the holder, the lefthand end viewing Fig. 1 is positioned at the base of the loop 41, whereupon the other end is rolled down to the base of loop 39 into the position shown. The resiliency of the holder clamps the fabric between its ends and the bases of the loops, thereby securely holding the sheet in position.

In order to protect the driving mechanism from the abrasive effect of dust and other particles produced by the operation of the machine, I have provided a boot 44, secured at its lower end around the guide 32 and having its upper end in-turned, as shown in Fig. 1, and clamped to the

motor base by screws 45 passing through a pair of clamping members 46 into tapped openings in the base 5. The boot, being of flexible material, does not interfere with relative movement between the base and the pad and at the same time completely encloses the drive shaft and operating mechanisms so as to protect them from the injurious effects of dirt and the like.

While I have shown and described a preferred embodiment of my invention, it will be obvious that the structural details thereof may be varied within considerable limits without departing from the essence of the invention as set forth in the following claims.

I claim:

1. In a surfacing machine, the combination of a motor, a surfacing pad, a motor base flexibly connected to said pad, a driving shaft journaled in said base, driving connections between one end of said shaft and said pad, a gear wheel mounted on the other end of said shaft, a motor shaft provided with a pinion meshing with said gear wheel, and an adjustable connection between the motor and said motor base whereby the relative position of said gear wheel and pinion may be adjusted.

2. In a surfacing machine, the combination of a motor, a gear wheel fixed on the motor shaft, a motor base, a shaft journaled in said base, a gear wheel fixed on said shaft and meshing with said first mentioned gear wheel, and an adjustable connection between said motor and said base for adjusting the relative positions of said gear wheels.

3. In a surfacing machine, the combination of a motor, a driving pinion on the motor shaft, a motor base, a shaft journaled therein, a gear wheel mounted on said last mentioned shaft, and an adjusting sleeve interposed between said motor and said base, said sleeve being concentrically associated with the motor and eccentrically associated with the base to provide for relative adjustment between said pinion and gear wheel.

4. In a surfacing machine, the combination of a motor, a pinion on the motor shaft, an adjusting sleeve rotatable concentrically with the motor shaft, a motor base rotatably associated with said sleeve and arranged eccentrically whereby rotation of said sleeve will effect a transverse adjustment between the motor and said base, a shaft mounted in the base, a gear wheel on the shaft adapted to mesh with said pinion, a surfacing pad, and driving connections between said shaft and said pad.

5. In a surfacing machine, the combination of a surfacing pad, an upwardly opening guideway connected to said pad, a motor driven shaft provided at its lower end with a crank pin disposed in said guideway, the lower end of said pin being tapered to ride upon the bottom of said guideway upon the application of downward pressure upon said shaft, a motor connected with the shaft, and flexible connections between the motor and said pad, said connections being adapted to yield under downward pressure to permit thrust to be exerted upon the pad through said shaft.

6. In a surfacing machine, the combination of a pad provided with an upwardly opening guideway, a motor base, a shaft mounted in said base and provided at its lower end with a crank pin disposed in said guideway, a motor mounted upon said base and operatively connected with said shaft, and resilient connections between the motor base and said pad, said connections being

adapted to sustain the weight of the motor but to yield under downward pressure exerted upon the motor to permit the transmission of said pressure to the pad through said crank pin.

5 7. In a surfacing machine, the combination of a motor base having a vertically disposed shaft rotatably mounted therein, a motor carried by the base and operatively connected with said shaft, a crank pin mounted on the lower end of said shaft,
10 a guide member into which said pin extends, a surfacing pad associated with said guideway to be actuated thereby upon rotation of said shaft, and a pair of U-shaped resilient connections between the pad and the motor base adapted to sustain
15 the weight of the motor but adapted to yield

under downward pressure exerted upon the motor to permit the transmission of said pressure through said shaft and crank pin to said pad.

8. In a surfacing machine, the combination of a surfacing pad, a guideway connected to said pad, a motor driven shaft provided at its lower end with a crank pin disposed in said guideway and adapted to engage the bottom of said guideway upon the application of downward pressure upon said shaft, a motor connected with the shaft and flexible connections between the motor and pad adapted to yield under downward pressure so as to enable exertion of thrust upon the pad through said shaft.

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