N. G. OLSON.

ELECTRICALLY OPERATED ABRADING MACHINE.

APPLICATION FILED JULY 18, 1918.

1,295,359.

Patented Feb. 25, 1919.

2 SHEETS—SHEET 1.

Fig. 1.

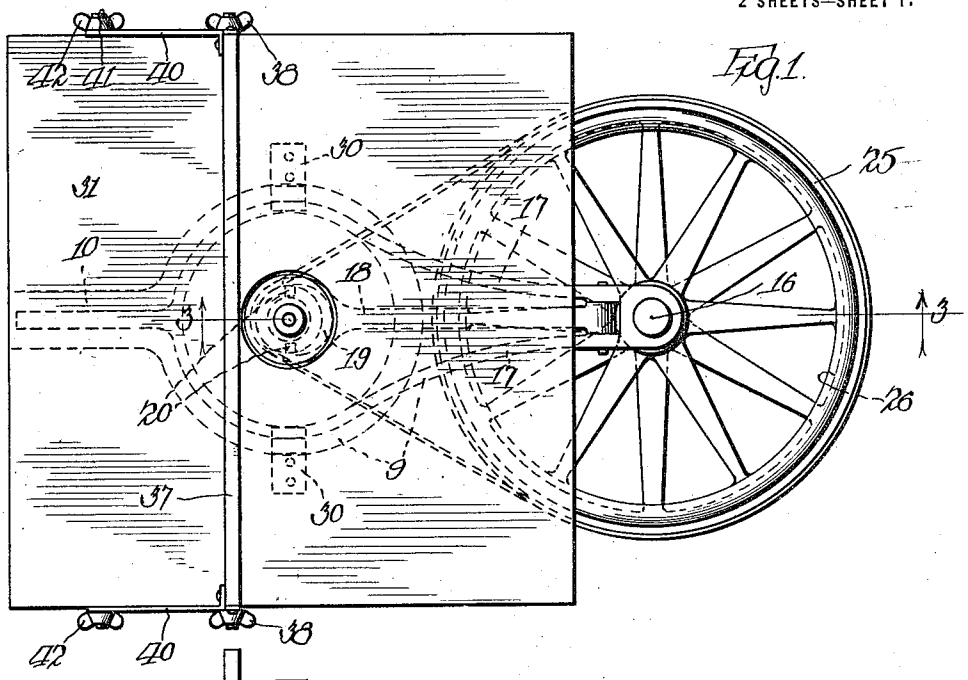
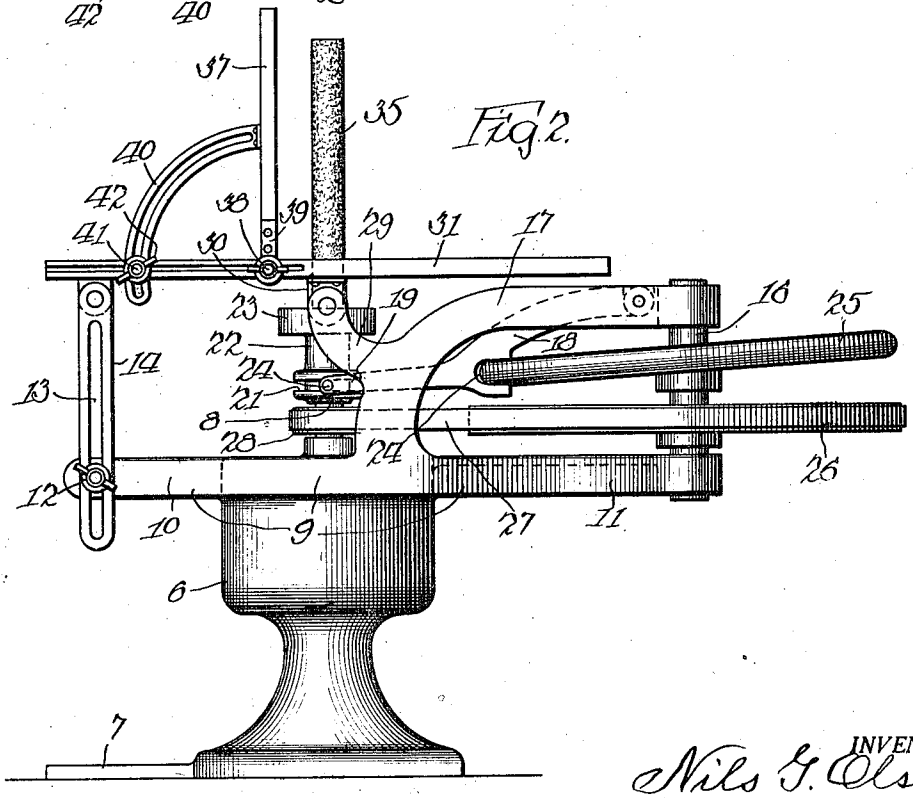


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3

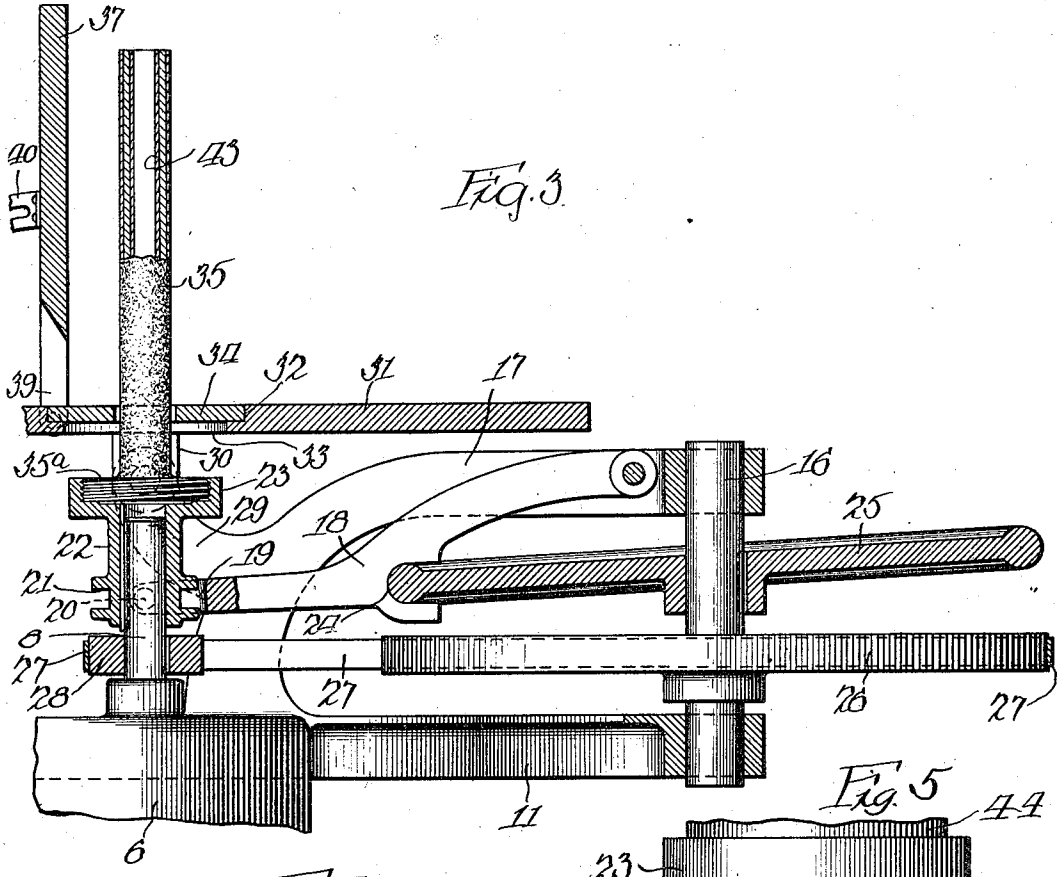


Fig. 4.

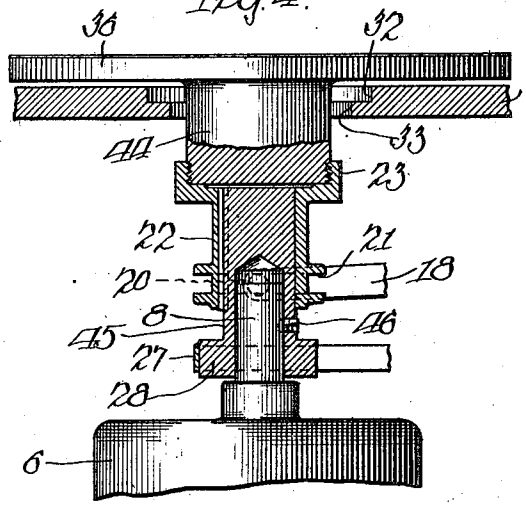
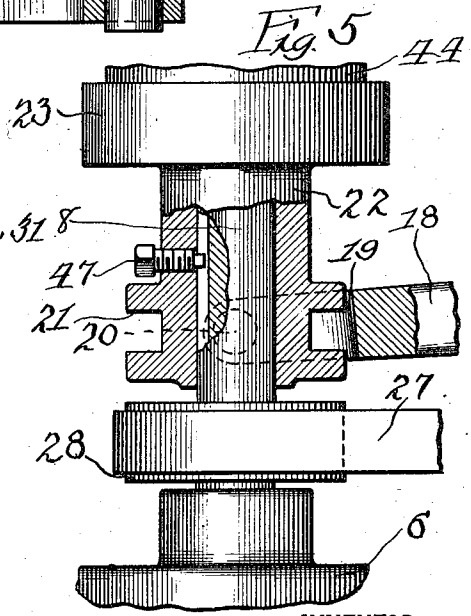


Fig. 5



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ELECTRICALLY-OPERATED ABRADING-MACHINE.

1,295,359. Specification of Letters Patent. Patented Feb. 25, 1919.

Application filed July 18, 1918. Serial No. 245,497.

To all whom it may concern:

Be it known that I, NILS G. OLSON, a subject of the King of Sweden, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Electrically-Operated Abrading-Machines, of which the following is a specification.

This invention relates to certain new and useful improvements in that type of machines used for smoothing woodwork, such as patterns, and other material and articles, by means of a roll, spindle disk or other suitable tool mounted on a rotatable shaft and faced with sandpaper, emery cloth, or other abrading material, and it consists in certain peculiarities of the construction, novel arrangement and operation of the various parts thereof as will be hereinafter more fully set forth and specifically claimed.

One of the objects of the invention, is, to provide a machine of the above mentioned general character which shall be simple and inexpensive in construction, strong, durable, efficient in operation, compact and portable in form and self driven, to the end, that it can be conveniently used as a unit bench machine, that is without connecting it up to power shafts by counter-shafts, belts, pulleys and the like, as has heretofore generally been necessary in floor machines of the said type. Another object of the invention, is, to furnish an abrading or sandpapering machine of such construction that it can be used for vertical or horizontal operation. A further object is to provide means for the ready interchanging of abrading tools or instruments used in connection therewith, so that articles of different sizes, shapes and construction can be operated upon with the highest degree of efficiency. Still another object, is, to provide means for reciprocal, as well as, rotary movement to the abrading tool, when reciprocal movement is desired.

Other objects and advantages of the invention will be disclosed in the subjoined description and explanation.

In the accompanying drawings, which serve to illustrate an embodiment of the invention,

Figure 1 is a plan view of the machine embodying one form of the invention.

Fig. 2 is a view in side elevation thereof.

Fig. 3 is a fragmental vertical sectional view taken on line 3—3 of Fig. 1 looking in the direction indicated by the arrows,

Fig. 4 is a view partly in section and partly in elevation of the rotatable parts of the machine showing a modification in the construction thereof and illustrating a part of the supporting table in section, and, Fig. 5 is a fragmental view partly in section and partly in elevation showing a modification in the means of securing the tool head carrying sleeve to the motor shaft so that said sleeve can be reciprocated without rotary motion.

Like numerals of reference refer to corresponding parts throughout the different views of the drawings.

Referring now to Figs. 1 to 3 inclusive of the drawings, the reference numeral 6 designates an electric motor, the base of which is provided with a lateral extension or leg 7, which when the motor is used for vertical operation is adapted to lie on the bench or support, but when the machine is used for horizontal operation as will be presently explained, this leg or extension 7 will afford one of the supports for the machine. As shown in the above mentioned figures of the drawings, the driving shaft 8 of the motor is extended vertically therefrom and may be of any desired length. Horizontally mounted on the upper portion of the motor 6 and surrounding the same is a frame which is designated as a whole by the reference numeral 9, and has oppositely extended portions 10 and 11, the former of which is provided near its outer end on one side thereof with a clamping screw 12 to fit in the slot 13 of an adjusting arm 14 pivotally mounted at its upper end to the table 15 which is for the purpose of supporting the work or material being operated on by the machine. The extension 11 of the frame 9 has journaled in its outer portion a shaft 16 which shaft is also journaled in the outer portion of an arm or bracket 17 extended upwardly from the middle portion of the frame 9 and then laterally over and in parallelism with the extended part 11 of said frame. This arm or bracket 17 is preferably forked as shown in Fig. 1 of the drawings, and the extension 11 may be of the same construction. Pivotally mounted at one of its ends between the prongs of the bracket 17 near the shaft 16 is a lever 18 which is extended inwardly or

toward the driving shaft 8 of the motor and is provided at its inner or said end with a yoke 19 each of the prongs of which is provided with an inwardly extended projection 20 to fit and operate in an annular groove 21 formed on the outer surface of the sleeve 22 which carries at its upper or outer end an internal screw threaded tool holder 23 of any suitable size. The lever 18 has at about its middle portion an open recess or slot 24 for the reception and operation of a wheel or disk 25 which is mounted on the shaft 16 at an oblique angle to the axis thereof as is clearly shown in Figs. 2 and 3 of the drawings. Mounted on the shaft 16 near the wheel or disk 25 is a pulley 26 over which a belt 27 passes and connects said pulley to a pulley 28 keyed or fixed to the shaft 8 of the motor near its juncture therewith. The sleeve 22 which carries the tool holder 23, as above stated, is keyed to the motor shaft 8 or connected thereto in such a manner as to turn therewith but to reciprocate thereon and as it is connected to the lever 18, by means of the projections 20 on the yoke 19 of said lever and the groove 21 in said sleeve, it is obvious that in the rotation of the shaft 16 which is driven by the belt 27 passing around the pulleys 26 and 28, the inclined wheel or disk 25 will cause the lever 18 to oscillate on its fulcrum and thus move the sleeve 22 and its holder as well as the tool carried by the latter back and forth while it is being rotated by the shaft of the motor. Each of the prongs of the bracket 17 is provided at its inner portion with an upwardly extended arm 29 which arms are located on opposite sides of the motor shaft. Pivotally mounted on the arms 29 by means of depending brackets 30 secured to the lower surface thereof is a table 31 for the support of the work, such as patterns and the like to be operated on by the machine. As is clearly shown in Figs. 1, 3 and 4 of the drawings the table 31 is preferably rectangular in shape, at least it has its edge adjacent to the extension 7 on the base of the motor 6 straight and in register with the outer end of said extension. It will also be observed by reference to said figures, that the table 31 is provided centrally with an opening having steps 32 and 33, see Figs. 3 and 4 of the drawings. The upper portion of this opening is for the reception of a centrally apertured disk 34 when the machine is equipped with a small tool 35, as shown in Figs. 2 and 3 of the drawings, but when a larger tool or disk 36, see Fig. 4, is employed the disk 34 should be removed. Located on the upper surface of the table 31 and extended transversely with respect to the frame 9 is an adjustable board 37 used as a rest or support for the work being operated on, if desired. The ends of the board 37 are pivotally connected to the edges of the table 31 by means of screws and clamping nuts 38 mounted on said screws, the latter being extended through suitable brackets 39 on the lower ends of the board. Extended outwardly and downwardly from each end of the board 37 is a slotted segmental bar 40, the slots of which receive screws 41 on the edges of the table. Engaging each of the screws 41 is a clamping nut 42 by means of which the bars 40 may be clamped and held in the proper positions to enable the board 37 to support the work in a proper position with respect to the tool 35 of the machine. By the foregoing arrangement of the table parts, it is obvious that the table 31 can be adjusted to different angles and that the board 37 can also be adjusted to different angles with respect to the table. The tool 35 is provided on its lower end with a screw threaded head 35^a, see Fig. 3, to engage the internal screw threads of the tool holder 23, by which arrangement it is obvious that tools of different sizes may be interchangeably used or connected to the holder 23 thus enabling pieces of work of different sizes to be operated on. The tool 35 may be hollow, as shown in Fig. 3, and faced both internally and externally with sandpaper or emery cloth 43 or any other suitable abrading material, so that when the pattern or article to be smoothed or operated on is placed in the proper position either externally or internally of the tool, the vertical and rotary movement of the latter will quickly grind off or smooth the portions of the pattern or piece of work as desired.

Instead of using an upright tool 35, as shown in Figs. 1 to 3 inclusive of the drawings, I may employ a disk 36 faced with sandpaper or other abrading material and having a screw threaded extension 44 to engage the tool holder 23, in which case it is obvious that the plate or disk 44 is removed from the opening in the table.

In the modified construction, shown in Fig. 4, it will be observed that the motor shaft 8 is much shorter than that used in the construction illustrated in Figs. 1 to 3 inclusive and that the pulley 28 around which the belt 27 passes is made integrally with a sleeve 45 which fits around the shaft 8 and is fixed thereto by a set screw 46, and that in this construction the sleeve 22 which carries the tool holder is keyed to the sleeve 45 but mounted for longitudinal movement thereon.

By providing the base of the motor 6 with a leg or extension 7, it is apparent that the machine may be located in a horizontal position in which case the edge of the table adjacent to the extension 7 on the base of the motor will act as one of the supports for the machine while said extension will act as the other, and it is manifest that the board 37 will be extended horizontally and

will act as the table of the machine. By my improvements it is apparent that both rotary and reciprocal movement will be given to the tool, and that the machine will be self driven, thus obviating the necessity of connecting it by means of belts or gears to a pulley on a counter or power shaft.

Should it be desired to dispense with the reciprocal movement of the tool carrying sleeve, it is obvious that the belt 27 can be thrown off the pulley 26 when of course the shaft 16 and wheel 25 thereon will cease to operate, thus permitting the tool carrying sleeve to rotate only with the motor shaft.

In the event it is desired to reciprocate the abrading tool without rotating the same, I may employ a construction like that shown in the modified form illustrated in Fig. 5 of the drawings. This modification consists in forming the motor shaft 8 with a longitudinal groove in its wall to receive the inner end of a screw 47, which when seated with its inner end out of contact with the shaft 8 as shown in said figure, will act as a key and allow the sleeve 22 to be reciprocated without turning with said shaft as is obvious.

As will be observed in Fig. 2 of the drawings, a portion of the edges of the table 31 adjacent to the bars 40 is provided with a longitudinal slot in which the screws 38 and 41 are movably located thus enabling the board 37 to be adjusted toward or from the tool as may be desired. The said slots may be dove-tail in cross section and the screws of a corresponding shape or enlarged at their inner ends to prevent their lateral displacement from said slots.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is—

1. In a machine of the class described, the combination with a motor, of an abrader carrying sleeve directly and slidably mounted on the power shaft of the motor for rotary movement with said shaft and for reciprocal movement thereon, and means operated by the motor shaft and engaging said sleeve to impart reciprocal movement to the latter.

2. In a machine of the class described, the combination of an electric motor, of a sleeve having a tool engaging head and directly and slidably mounted on the power shaft of the motor for rotary movement with said shaft and for reciprocal movement thereon, means operated by the motor shaft and engaging said sleeve to impart reciprocal movement to the latter, and an abrading tool detachably engaging said head.

3. In a machine of the class described, the combination with a portable electric motor adapted to be fixedly mounted when in operation, of a sleeve having a tool engaging head and directly and slidably mounted on the power shaft of the motor for rotary movement with said shaft and for reciprocal movement thereon, means operated by the motor shaft and engaging said sleeve to impart reciprocal movement to the latter, and an abrading tool detachably engaging said head.

4. In a machine of the class described, the combination with an electric motor, of a frame mounted thereon and having a lateral extension, an arm or bracket extended near said extension, a driven shaft journaled on said arm and extension, a sleeve having a tool engaging head and mounted on the shaft of the motor for rotary and reciprocal movement, a lever fulcrumed on said arm and engaging said sleeve and having a recess between its ends, a wheel diagonally mounted on the driven shaft and engaging the recess of said lever, and means connecting the driven shaft and motor shaft to impart rotary movement to the former.

5. In a machine of the class described, the combination with an electric motor, of a frame mounted thereon and having opposed extensions, an arm or bracket extended near one of said extensions, a driven shaft journaled on said arm and extension, a sleeve having a tool engaging head mounted on the shaft of the motor for rotary and reciprocal movement, a lever fulcrumed on said arm and engaging said sleeve and having a recess between its ends, a wheel diagonally mounted on the driven shaft and engaging the recess of said lever, means connecting the driven shaft and motor shaft to impart rotary movement to the former, a table pivotally mounted on the frame and having an opening therein near said tool engaging head, means adjustably connecting the table and one of the extensions of the frame, and an abrading tool detachably engaging said head.

6. In a machine of the class described, the combination with an electric motor having on its base an extension, of a frame mounted on the motor and having opposed extensions, an arm or bracket extended near one of said extensions, a driven shaft journaled on said arm and extension, a sleeve having a tool engaging head mounted on the shaft of the motor for rotary and reciprocal movement, a lever fulcrumed on said arm and engaging said sleeve and having a recess between its ends, a wheel diagonally mounted on the driven shaft and engaging the recess of said lever, means connecting the driven shaft and motor shaft to impart rotary movement to the former, a table pivotally mounted on the frame and having an opening therein near said tool engaging head, one of the edges of said table being located in a plane with the outer end of the extension on the base of the motor, means adjustably connecting the table and one of the extensions of the frame, a board adjustably mounted on the table near the open-

ing therein, and an abrading tool extended through the opening in the table and detachably engaging said head.

7. In a machine of the class described, the combination with an electric motor having an extension on its base, of a frame mounted on the motor, a table pivotally mounted on the frame, means connecting the table and frame for adjusting the former, said table having one of its edges in a plane with the outer end of the extension on the base of the motor, a board extended across the table and pivotally connected thereto, and means connecting the table and board for holding the latter in its adjusted positions.

NILS G. OLSON.

Witnesses:
CHAS. C. TILLMAN,
C. CASEY.