Oct. 6, 1953 W. G. MITCHELL 2,654,190

PORTABLE POWER-OPERATED ABRADING MACHINE

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FIG. 1

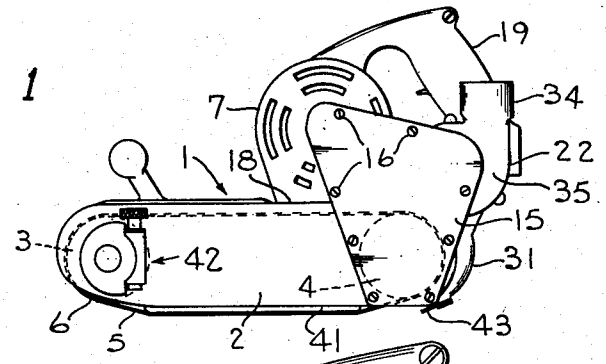
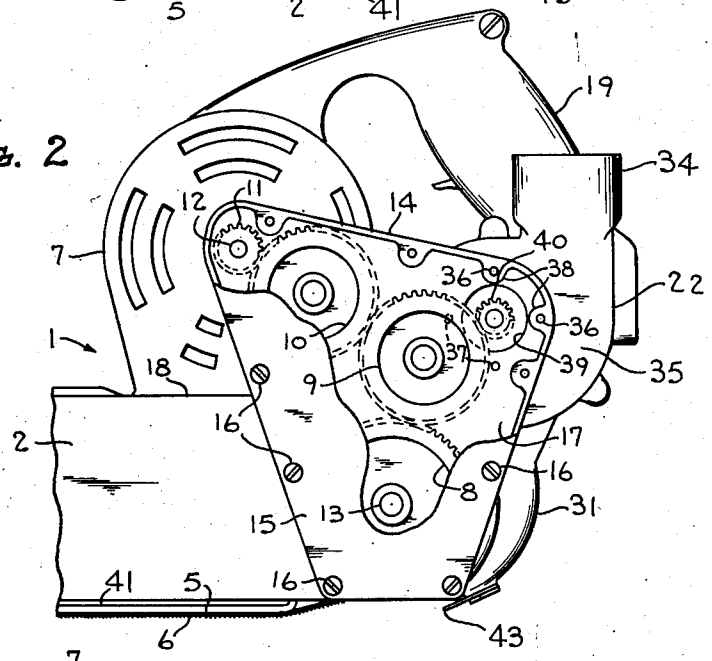


FIG. 2



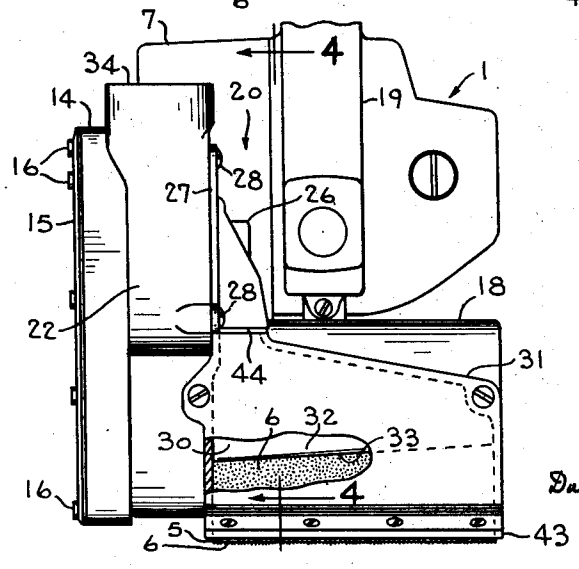


FIG. 3

INVENTOR.
WALTER G. MITCHELL
BY
Davis, Lindsey, Hibben & Noyes
ATTORNEY

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FIG. 4

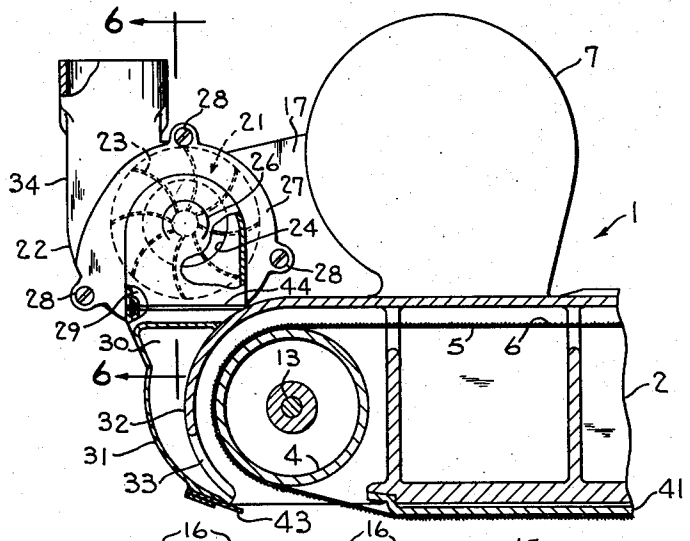


FIG. 5

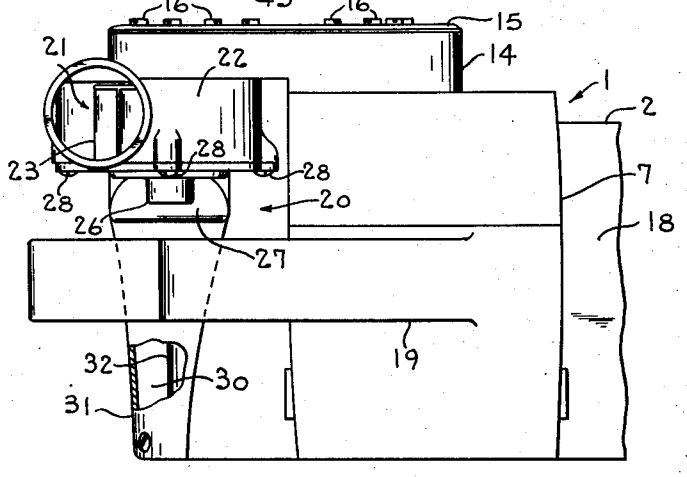
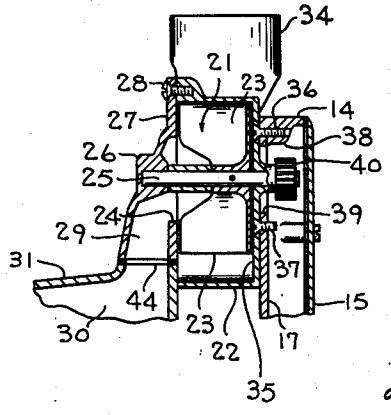


FIG. 6



INVENTOR.
WALTER G. MITCHELL
BY
Davis, Lindsey, Hibben + Noyes
ATTORNEY

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PORTABLE POWER-OPERATED ABRADING MACHINE

Walter G. Mitchell, Aurora, Ill., assignor to Thor Power Tool Company, Aurora, Ill., a corporation of Delaware

Application May 13, 1949, Serial No. 93,127

7 Claims. (Cl. 51—170)

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This invention relates to improvements in portable, power operated, sanders and abrading machines for smoothing and/or finishing metal and/or non-metallic surfaces.

The principal object and purpose of my invention is to provide the machine with means whereby a suction fan may be readily and easily applied to the machine to serve as a unit for removing the sanding and/or abrading dust in the use of the machine.

A further and more specific object of my invention is to provide the abrading machine with an aperture or similar means in the gear casing of the machine whereby the driving shaft of the fan element may be extended into the gear case and connected with one of the gears of the train in the gear casing for rotating the fan element from the power motor—electric—when such is the prime mover.

A further object of my invention is to provide a space on the machine to receive and mount the fan unit.

The invention consists further in the features of construction and combination of parts hereinafter described and claimed.

In the accompanying drawings:

Fig. 1 is a side elevation view of a power operated, portable, sanding or abrading machine embodying the fan assembly of my invention;

Fig. 2 is a view on a larger scale of the rear end portion of the machine showing the gear train which drives the machine parts;

Fig. 3 is an end view of the assembly shown in Fig. 1 partly broken away to illustrate certain details of the construction to be hereinafter described;

Fig. 4 is a vertical sectional view taken on line 4—4 of Fig. 3;

Fig. 5 is a top plan view of the assembly shown in Fig. 4; and

Fig. 6 is a vertical sectional view taken on line 6—6 of Fig. 4 to show a detail of construction.

In the drawings, 1 indicates the supporting frame of a portable, power operated, sanding or abrading machine of the desired size and shape. The support 1 has a lateral wall 2 at one side of the machine to support a pair of revolvable drums or pulleys 3, 4 adjacent to the opposite ends of the machine as in devices of this character. Trained or looped about the drums 3, 4 is an endless, flexible, belt 5 having an outer sanding or abrading surface 6. The abrading material employed on the belt is of the kind intended for the work to be performed by the machine.

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The belt 5 is removable from the drums 3, 4 for changing or replacement as may be required in the use of the machine, the latter being made open on its side opposite to the wall 2.

The drum 3 which is adjacent to the front end of the machine is the idler drum, while the drum 4 which is adjacent to the rear end of the machine is the driving drum, the latter being connected to and driven by the power motor 7 mounted on the frame 1 as indicated in Fig. 1. The motor 7 may be electrically operated, the machine being equipped with an electric current supply cable (not shown) for the motor as in devices of this character.

A gear train is indicated in Fig. 2 and has a series of gear wheels 8, 9, 10 and 11, the latter being keyed or otherwise fixed to the armature shaft 12 of the power motor 7. The gear wheel 11 is shown in the form of a pinion. The gear wheel 8 is keyed or fixed to the axis element 13 of the driving drum 4.

The intermediate gear wheels 9 and 10 are shown in detail in Fig. 2, all of the gear wheels, that is, the gear train, being located within a protective case or housing 14 fixed to and carried by the frame 1 adjacent to the rear end of the machine and on the same side as the side wall 2. A plate 15 fits over and covers the front side of the gear box 14, screws or fasteners 16 being employed to releasably secure the cover 15 in place. The rear wall 17 mounts the gear wheels 9 and 10 and extends above the top wall 18 of the support 1 to reach the armature shaft 12 and the fan shaft, the latter to be presently described.

Fixed or otherwise secured to the motor 7 is a handle member 19 disposed at the rear end of the machine frame 1. The handle 19 may also be fixed to the support 1, the handle member 19 in accordance with my invention being spaced laterally from the gear box 14 where the latter extends above the frame wall 18. The handle member 19 may be of the D-type to be grasped by one hand of the operator manipulating the machine and contains the control switch for the tool motor 7.

The space above mentioned is shown in Figs. 3 and 5 and is marked 20. Located in the space 20 is rotary fan 21 of the suction type for removing dust. Said fan 21 has an outer casing 22 providing an operative chamber for the radial-like fan vanes 23 as shown in Figs. 4 and 6.

The air inlet 24 for the fan is about the shaft 25, one end of which is journalled in a boss 26

on the front wall 27 of the fan casing. This wall 27 is held in place by screws or fasteners 28 adjacent to the outer periphery of the parts as shown in Figs. 4 and 6. Said cover wall 27 is fashioned with an air passage 29 joined at one end with the intake 24 for the fan and at its lower end with a passage 30 in a casting or fixture 31 at the rear end of the machine and conforming generally to the curvature of the driving drum 4 and is cut-off at an angle as at 33 to increase the passage for the dust thrown by the tangential action of the moving belt 5, the latter being rotated by the drums 3, 4 as well understood in this art.

The outlet for the fan 21 is at its periphery and opens into a discharge spout 34 rising upwardly from the fan housing 22 and to which spout a dust collecting bag (not shown) of the customary type as used in these dust collecting systems is releasably connected. The bag is supported in operative position above the machine frame 1 not in the way of the handle 19 by a wire attachment (not shown) applied to either the machine frame or to the spout 34.

The rear wall 35 of the fan housing 22 fits flatwise against the gear case wall 17 as shown in Fig. 6. Here, it will be noted that screws or fasteners 36, 37 secure the fan housing wall 35 to the gear box wall 17. Two screws 36 are threaded into bosses 38 on the gear box casing, while two of the screws 37 are threaded directly into the wall 17 and are disposed below the lugs as indicated in Fig. 2.

Between these fasteners 36, 37, the box wall 17 is provided with a relatively large opening 39 aligned with the fan shaft 25 for the latter to extend into the gear box and locate the pinion 40 on said shaft for meshing with the adjacent gear wheel 9 as indicated in Fig. 2.

Hence, when the fan assembly is located in the space 20 and mounted to the gear box 14 the fan 21 is connected with the motor 7 for operation thereby.

The machine frame or support 1 has a bed plate 41 to support the lower lap or run of the belt 5 when the machine is pressed against the surface or work to be treated.

At 42 is a fixture for mounting the axis member of the idler drum 3 for tightening and loosening the belt 5 and aligning the drum with the driving drum 4 as disclosed and claimed in the copending application of Melvin B. Gentzel, Serial No. 13,776 filed March 9, 1948, now Patent No. 2,565,223, dated August 21, 1951.

With the gear casing 14 provided as above described, the fan 21 may be used with the machine as a unit when desired. The applying may be quickly and easily made and the machine given a dust collecting system. In this connection I might point out that the wall 31 carries a flexible or rubber-like strip 43 to bear against the work surface to deflect the dust particles into the conduit 30. I might also point out that a gasket 44 seals the joint between the casing 31 and the fixture 26 where meeting as shown herein. A dowel pin arrangement may be used in this connection.

The structure disclosed is simple in construction, inexpensive and efficient for the purpose intended.

The details of construction and arrangement of parts shown and described may be variously changed and modified without departing from the spirit and scope of my invention, except as pointed out in the annexed claims.

I claim as my invention:

1. In a portable power operated abrading machine of the character described, a support, an abrading element and a power motor for operating the same, both mounted on said support, a handle at one side of the support and extending rearwardly of said motor, a gear train directly connecting the motor to said abrading element for operating the same, a gear case on the support enclosing the gear train, said gear case being laterally spaced from the handle and extending rearwardly of said motor in parallel relation with said handle to provide a space therebetween, a suction fan for removing dust from said machine mounted in said space and having a housing detachably secured to said gear case, the latter having an opening therein facing said fan, a shaft for the fan extending through said opening, and a gear pinion on the shaft within said gear case in mesh with one of the gear wheels of the gear train.

2. In a portable power operated abrading machine of the character described, a support, an abrading element and a power motor for operating the same, both mounted on said support, a handle at one side of said support, a gear train operatively connecting the motor to said abrading element for operating the same, a gear case on the support enclosing said gear train, said gear case being laterally spaced from said handle to provide a space therebetween, a suction fan for removing dust from the machine mounted in said space and comprising a housing having an inner wall adjacent to said gear case in contact with and detachably secured thereto, a shaft for said fan having a pinion extending into said gear case and operatively connected with one of the gear wheels of the gear train, and an outer wall for the fan housing opposite to said pinion and providing a bearing for the adjacent end of said shaft.

3. In a portable power operated abrading machine of the character described, a support, an abrading element and a power motor for operating the same, both mounted on said support, a handle at one side of said support, a gear train operatively connecting the motor to said abrading element for operating the same, a gear case on the support enclosing said gear train, said gear case being laterally spaced from said handle to provide a space therebetween, a suction fan for removing dust from said machine mounted in said space and having an outer housing detachably supported by said gear case, and the outer wall of the fan housing providing an intake for the fan and air flow passage leading thereto.

4. In a portable power operated abrading machine of the character described, an elongated supporting frame having abrading means operatively supported therein, a motor mounted above said frame adjacent the rear end thereof, an upright gear case secured at one side of said frame adjacent said rear end and projecting upwardly above said frame, the upper end of said gear case having a forwardly extending portion adjacent said motor and also having a portion extending rearwardly of said motor, gear means within said gear case directly connecting said motor with said abrading means, a removable fan housing disposed rearwardly of said motor and detachably secured in flatwise relation against said gear casing at the rearwardly extending portion thereof, and a suction fan rotatably supported in said housing on a substantially horizontal axis and having a fan shaft extending

through said gear case and operatively connected to said gear means.

5. In a portable power operated abrading machine of the character described, an elongated supporting frame having abrading means operatively supported therein, an upright gear case secured at one side of said frame adjacent the rear end thereof and projecting upwardly above said frame, the upper end of said gear case having a forwardly extending portion and a rearwardly extending portion and said gear case also having a flat inner wall provided with an opening at said rearwardly extending portion of the gear case, a motor mounted above said frame and having a shaft extending into said gear case at said forwardly extending portion thereof, gear means within said gear case directly connecting the motor shaft with said abrading means, and a removable fan housing detachably secured flatwise against the inner wall of said gear case at said rearwardly extending portion of the latter and rearwardly of said motor, said fan housing having a suction fan rotatably supported therein on a substantially horizontal axis with the fan shaft extending through said opening in said inner wall of said gear case into operative engagement with said gear means for driving said fan.

6. In a portable power operated abrading machine of the character described, an elongated supporting frame having abrading means operatively supported therein, a motor mounted above said frame adjacent the rear end thereof, an upright gear case secured at one side of said frame adjacent said rear end and extending upwardly above said frame adjacent said motor, gear means within said gear case operatively connecting said motor with said abrading means, an operating handle extending rearwardly of said motor and disposed above said frame, said handle being spaced transversely from said gear case to provide a fan-receiving space therebetween, a suction fan and housing disposed in the space between said handle and said gear case with said housing being detachably secured to the inner face of said gear case and said fan being operatively connected to said gear means, and a suction chamber communicating with said fan housing and extending downwardly and laterally below said handle into communication with said abrading means adjacent the rear of said supporting frame for removing dust during operation of the machine.

7. In a portable power operated abrading machine of the character described, an elongated supporting frame having abrading means operatively supported therein, a motor mounted above said frame adjacent the rear end thereof, an upright gear case secured at one side of said frame adjacent said rear end and extending upwardly above said frame adjacent said motor, gear means within said gear case operatively connecting said motor with said abrading means, a removable fan housing having an integral inner wall detachably secured to said gear case rearwardly of said motor, a suction fan in said fan housing having a shaft journaled in said inner wall and extending into said gear case and operatively connected to said gear means, an outer wall detachably secured to said fan housing and providing a bearing for the opposite end of said shaft and an air intake for said fan, and a suction chamber secured to said supporting frame and communicating with said air intake and said abrading means for removing dust during operation of the machine.

WALTER G. MITCHELL.

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