

May 7, 1935.

H. L. MYERS

2,000,784

PORTABLE SANDERPLANE

Filed Oct. 2, 1934

3 Sheets-Sheet 1

Fig. 1.

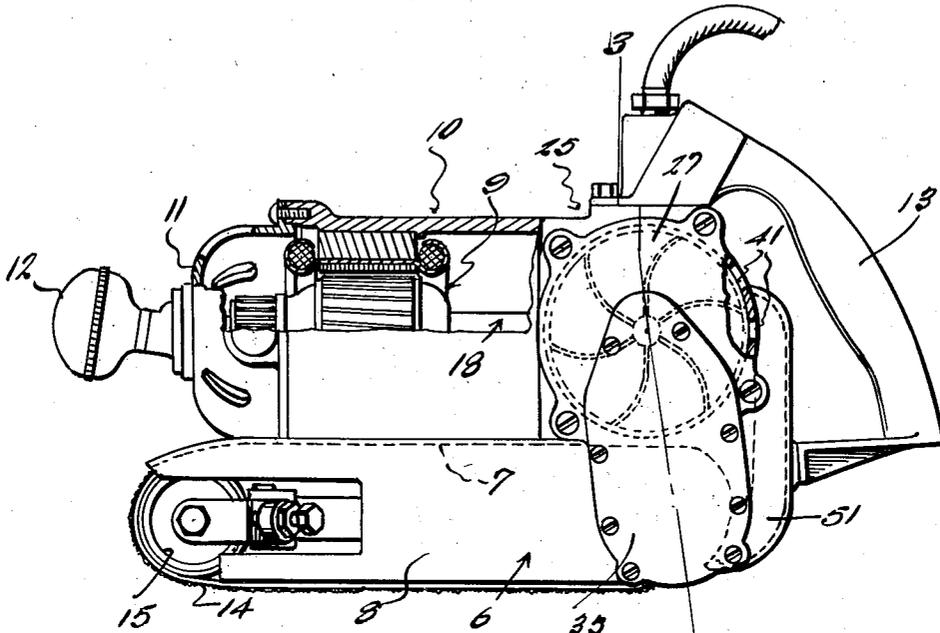
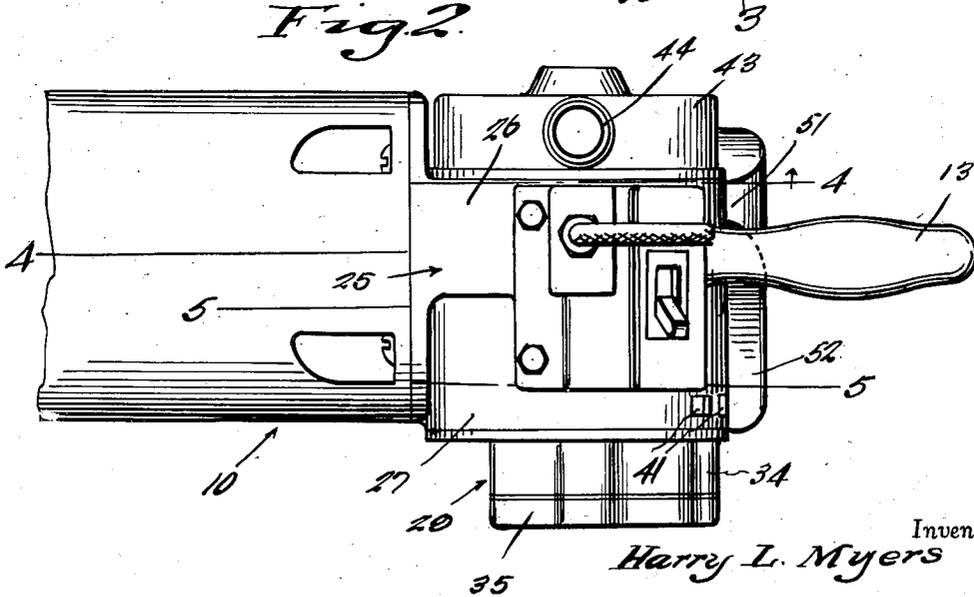


Fig. 2.



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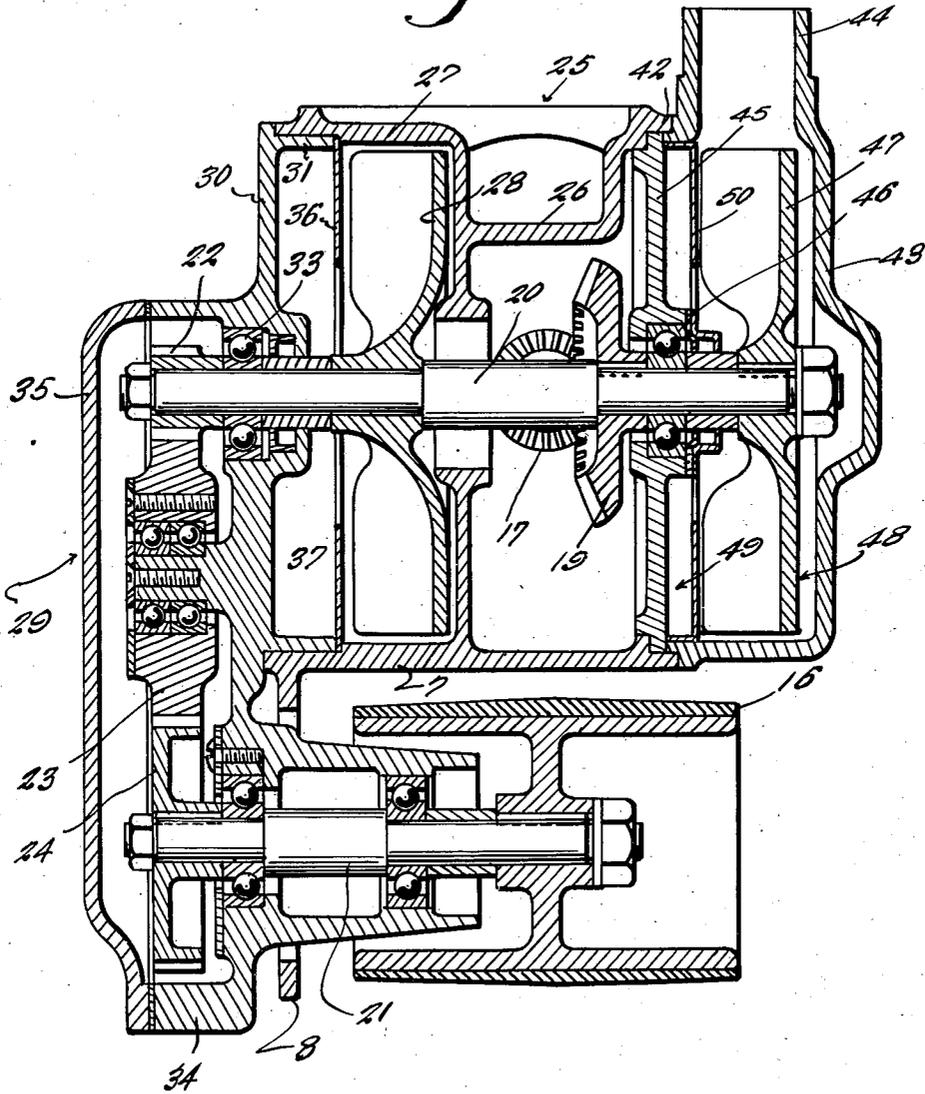
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3 Sheets-Sheet 2

Fig. 3.



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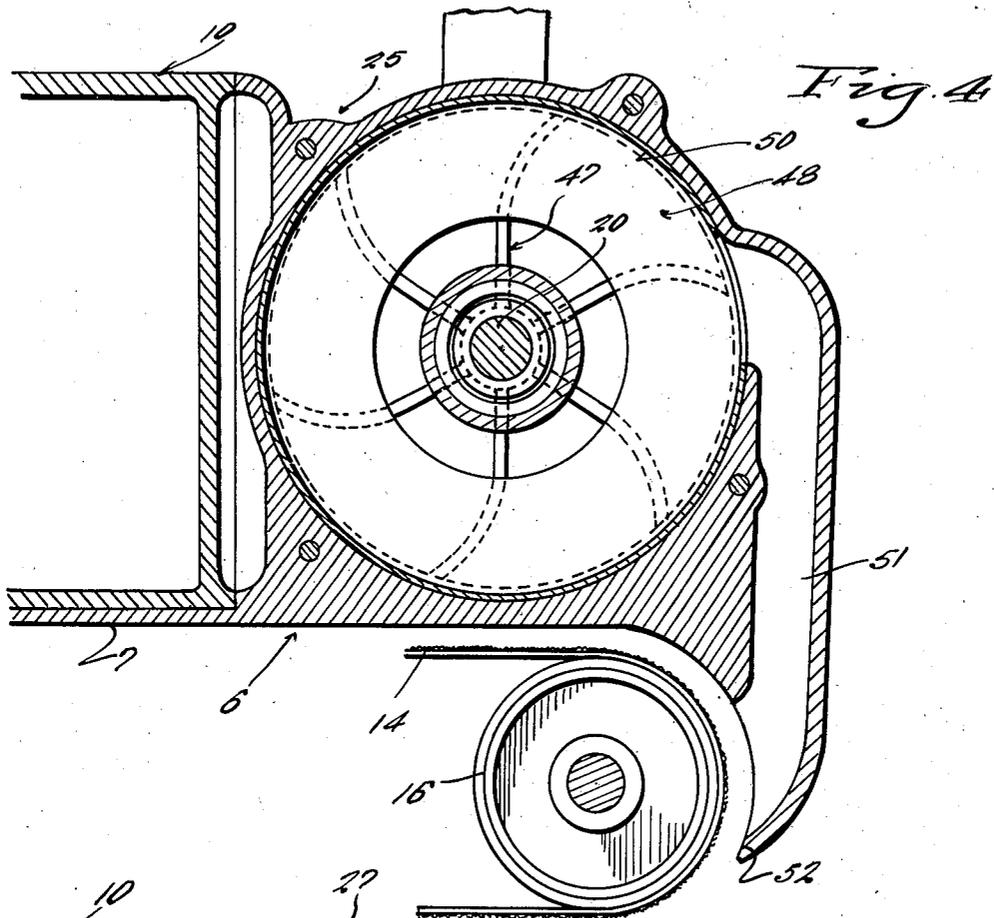


Fig. 4

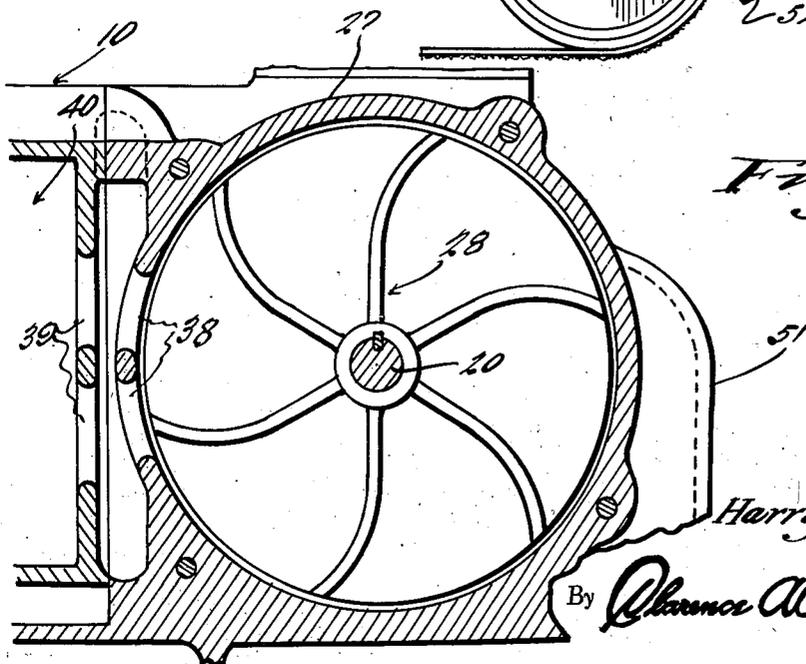


Fig. 5

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UNITED STATES PATENT OFFICE

2,000,784

PORTABLE SANDERPLANE

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Application October 2, 1934, Serial No. 746,612

8 Claims. (Cl. 51—170)

This invention relates to an improved bench-type sanderplane and has more specific reference to a portable machine characterized especially by improved motor ventilating means, and distinguished further by the incorporation there-
5 in of dust collecting means.

Classified more explicitly the inventive conception has to do with the development and perfection of a novel ventilated sanderplane of the
10 type depicted and claimed in Patent 1,969,318, granted to me under date of August 7, 1934. It follows, therefore, that in order to better portray the alleged novelty and to reflect the ingenious adaptation and innovations found in this new
15 machine, it will be compared briefly with the aforesaid patented machine.

In the prior patent just referred to I have adopted a centralized double-acting fan arrangement wherein a duplex or twin fan is utilized and
20 contained in a dual compartment forming a part of the frame structure. One compartment serves to house an air suction and expelling fan mounted on the motor shaft and located in a position to suck the air in through an apertured cap on the
25 front of the motor casing in a manner to draw the air through said casing to contact the commutator and motor with a view toward effecting reliable ventilation. In this arrangement the air
30 currents are discharged through orifices or openings formed in the motor casing at a point near the center of the machine. This arrangement being subject to certain disadvantages has presented a problem resulting in the discovery of the
35 need for a revised and refined ventilating system and means for rendering it operative.

The type of plane illustrated in Patent 1,969,318 is used in a vertical position as well as in a horizontal position. Especially when used in a vertical position, the discharged air currents flow
40 into the face of the operator. The air is frequently laden with wood dust. Hence it is objectionable. Then too, it has been discovered that this method of circulating the air by a suction fan occupying the position shown in said
45 patent is such that the velocity cannot be sufficiently controlled for effective and uniform cooling.

Under the circumstances, I have found it expedient and practicable to install the ventilating fan and its complemental parts at the rear of the
50 machine, at which point the air is taken in and from which point it is expelled in the form of an air blast into the motor casing and against the motor and thereafter allowed to discharge outwardly through the apertured motor cap. This

permits the production of the requisite air volume aptly fitted to literally bathe the motor in air and constitutes, it is believed, a vast improvement resulting in effective air circulation and evacuation
5 so as to promote more dependable ventilation and consequent motor cooling.

By thus conferring additional novelty on a sanderplane of this type in contrast to the aforementioned patented machine, it is believed to possess characteristics so vital and indispensable
10 as to warrant its sanction and unqualified endorsement and acceptance by the trade.

In addition to the air circulation and ventilating feature, the improved machine to be herein-
15 after explicitly described, is characterized by a new rear end construction which embodies, in addition to the fan, a unique dust collecting means properly balanced and aptly fitted to fulfill the requirements of a structure of this classification.

By way of contrast with the aforesaid patent
20 and similar prior art devices, those skilled in the art to which the invention appertains will further discern the provision in this improved machine of a simplified and consolidated rear
25 end construction which utilizes a transverse power take-off shaft to transmit motion to the sanding belt driving means and which has the further capacity of accommodating a double fan
30 assemblage and housing means therefor wherein one fan serves as a ventilating device and the other fan as a dust collecting device.

Other features and advantages will become more readily apparent from the following description and drawings.

In the drawings:

Figure 1 is a side view, partly in section and partly in elevation, illustrating a sanderplane constructed in accordance with the principles of the present invention and depicting sufficient
40 of the structure to permit a clear understanding of the invention to be obtained.

Figure 2 is a somewhat enlarged top plan view utilized to disclose the so-called rear end construction and its features so vital and instrumental in accomplishing the improved result
45 herein sought.

Figure 3 is an enlarged transverse vertical sectional view through the rear end construction of the machine, the section being taken on the vertical line 3—3 of Figure 1.

Figures 4 and 5 are enlarged fragmentary sectional and elevational views taken on the planes of the irregular lines 4—4 and 5—5 respectively of Figure 2.

Referring now to the machine as a whole as

depicted in Figure 1, certain conventional parts are shown. These are believed to be essential to a clear understanding of the complete machine. In this figure, the numeral 6 is employed to designate generally what may be described as the mobile frame or chassis. Among other parts, this includes a horizontal base plate or platform 7 formed along one edge with a depending guard flange 8. This serves as a carriage for the rear end construction, the abrading means and the motor. The motor may be referred to as a unit by the numeral 9 and it is contained in an appropriate casing 10 which serves as a housing therefor. This is placed horizontally on the frame and at its forward end is provided with the customary apertured ventilating cap 11. This is equipped with a hand knob 12 which, together with the hand grip 13 at the rear, serves to facilitate handling of the machine. The endless sanding or abrading belt is denoted by the numeral 14 and is trained over a front adjustable roller 15 and a traction or power supply roller 16 at the rear. This roller 16 is propelled very much the same as is done in the aforementioned Patent 1,969,318, which method of propulsion is not specifically claimed here. It may be mentioned, however, and upon referring to Figure 3 that there is a bevel pinion 17 on the rear end of the motor shaft 18 which meshes with a beveled gear 19 carried by a transverse power take-off shaft 20. This is supported for rotation in bearings in the rear end construction. It serves to drive the stub shaft 21 which carries the traction roller or drum 16 through the instrumentality of a train of gears embodying the intermeshing gears 22, 23, and 24. As before pointed out, however, this shaft 20 has an additional function such as constitutes a novel contribution to the novelty of the claims hereinafter made.

Coming now to the construction and arrangement of the so-called rear end construction of the machine, I call attention first to that part of the casting denoted by the numeral 25. This is formed integral with and rises above and is located centrally on the base plate 7 and is fashioned to provide an enclosure 26 (see Figure 3) which functions as a housing for the gearing 17 and 19. At the left there is an extension 27 of somewhat circular cross sectional form which forms a shell and is made to function as a housing for the ventilating or air propulsion fan 28. This fan is keyed for rotation on the power take-off shaft 20. At this point of construction and arrangement is a unit 29 which serves primarily as a transmission gear box which includes a closing plate 30 having a marginal flange 31 which telescopes into the circular shell 27 and cooperates therewith in defining the fan housing. This plate carries a ball bearing unit 32 to accommodate the adjacent portion of the shaft 20. It is also fashioned as at 25 to provide a receptacle or container for the gears 22, 23, and 24. Then too, it serves to permit a cover plate 35 to be bolted thereto. Consequently the complete part 29, as a unit, serves as a closure for the fan housing 27 and as a casing or housing for the gears 22, 23, and 24. The numeral 36 in Figure 3 is a partition which divides the fan housing (parts 27 and 30) into two separate chambers, that is, the air intake chamber 37 and the fan chamber. The fan chamber has its rim or wall provided with air discharge passages 38 as shown in Figure 5 which register with apertures 39 in the motor compartment 40. Hence it is by way

of these openings 38 and 39 that the air blast from the fan is forced into the motor compartment for cooling the motor. It is to be mentioned in connection with this assemblage that the air is taken in through the ports or inlet openings 41 formed in the marginal portion at the rear of the ventilating fan housing. It is obvious, therefore, that this is a unique consolidation of parts and coordination of structural features.

I call attention now to the fan assemblage at the opposite end of the shaft 23 which forms an important part of the so-called dust collecting system. To begin with, it will be noted that the flange 42 on the open right hand side of the gear housing 26 serves to accommodate the body portion 43 of the dust fan housing. This body portion has a neck 44 to accommodate the dust collecting bag (not shown). In addition it has a flange which fits telescopically into the flange 42 and located between these two flanges is a partitioning disk 45 which serves as a support for the adjacent bearing 46 and which closes the gear housing 26 on one side and the dust fan housing on its inner side. The dust fan is denoted by the numeral 47 and is constructed to take the air in at its center and force it out through the discharge neck 44. It is obviously keyed on the same shaft 23. It is contained in a separate compartment 48 which is somewhat wider than the dust intake compartment 49. The latter compartment is formed by the adoption and use of a cup-like or centrally apertured divider 50. The dust is fed into this relatively small or narrow compartment 49 by way of a suitably shaped and cast duct 51 (see Figure 4) which is fashioned at its bottom to form an intake nozzle 52 cooperable with the abrading belt surrounding the rear driving roller 16. The nozzle is of any appropriate proportion and shape and delivers the dust up through the duct and the duct carries it into the compartment 49 where it is sucked through the centrally apertured portion of the divider 50 and into the compartment 48 from which it is evacuated by the expulsion action of the fan 47.

Without considering the specific structural details of the rear end construction, it is to be pointed out here that the essential novelty is predicated upon the motor housing 9 mounted on a mobile frame or chassis with the apertured cap 11 at one end and the ventilating fan and air circulation arrangement at the opposite end. In particular it will be noted that the fan has its axis at right angles to the motor shaft and that the fan is contained in a housing whose peripheral portion is apertured with the apertures communicating with the adjacent or rear end of the motor casing and opposed apertures 41 arranged to take in the air. The result is that this fan, which is driven from the motor shaft 18 by way of the power take-off shaft 21 develops the requisite volume or velocity of clean air which is drawn in from the rear and propelled from the fan housing into the motor housing. This stream of air plays on the motor so that it is literally bathed with the currents of cool air, which currents gradually pass out through the apertured cap 11. This method and means of air development circulation and ventilation is believed to be a noteworthy improvement in this line of endeavor.

It is evident that the ventilating fan associated with the consolidated rear end construction is located at a point of vantage in respect to the component and co-acting parts thus serving as

a logical assemblage aptly fitted for ventilating the motor. This handling of the air from the rear end and in a position away from the face of the operator keeps the discharged air out of his face and is calculated to more nearly satisfy the requirements of effective air circulation and evacuation and to promote a more dependable system of cooling and ventilation.

In addition to this, the unique machine is accredited as possessing additional attributes of construction in that it provides for a uniform balance at the rear end due to the adoption and use of the double-acting fan assemblage, that is, one fan for the air and one fan for the dust, these being located at the opposite ends of the power take-off shaft and which allocation of parts is advantageous from the standpoint of the manufacturer as well as the user. The results which accrue from this duplex fan arrangement will forestall trouble from clogging due to the accessibility of parts and their readiness to adjustment and repair.

I desire to emphasize also the multiple purpose of the simplified casting 25 forming a dominant part of the rear end construction in that it functions as a mounting for the fans and their associated parts as well as an enclosure or housing for the gearing 17 and 19. It follows, therefore, that all of the parts have been carefully selected and mechanically co-ordinated to provide a machine whose structures and features transcend in importance similar characteristics found in analogous bench and hand planes of the endless abrasive belt type.

Needless to say, the drawings serve to illustrate the preferred embodiment of the invention. At the same time, I desire it understood that modification, re-allocation of parts, and other deviations such as fall within the scope of the adjoined claims and spirit of the invention may be, and probably will, be resorted to in the manufacture of the machine from time to time.

What is claimed is:

1. In a structure of the class described, a frame, sanding means on said frame, an electric motor supported on the frame, said motor including a shaft and a casing therefor having an apertured cap at one end, a power take-off shaft mounted for rotation on the other end of said frame located at right angles to the motor shaft, an operating connection between said shafts, a ventilating fan housing on said frame located at the last named end of said motor casing, said power take-off shaft extending through said fan housing, and a rotary fan also mounted on said last named shaft.

2. A sanderplane of the class described comprising a portable frame including a longitudinally elongated horizontal base plate, longitudinally spaced rollers mounted for rotation beneath said plate, an endless abrading belt surrounding said rollers, a horizontally disposed motor mounted on and above said base plate and including a casing having an apertured cap, said motor including a power shaft extending through the one end of said casing, a right angularly disposed power take-off shaft, supporting and bearing means for said power take-off shaft, an operating connection between said shafts, a further operating connection between said power take-off shaft and one of said rollers, a ventilating fan on said power take-off shaft, a housing therefor on said base plate, said housing including inner and outer compartments, the wall of the outer compartment having air passages, and

the marginal wall of the inner compartment being provided with complementary air passages, said compartments being in communication with each other, and said inner compartment being in communication with said motor casing to permit air to be circulated in said motor casing.

3. A sanderplane of the class described comprising a frame, sanding means on said frame, an electric motor carried by said frame, handling means associated with said frame, said motor including a longitudinal power supply shaft extending through one end of the motor casing, a transverse power take-off shaft arranged at right angles to said motor shaft, an operating connection between said shafts, a second operating connection between the power take-off shaft and sanding means, a dust collector duct having a nozzle on said frame, a fan housing on said frame, said power take-off shaft extending into said fan housing, a fan on said power take-off shaft, said fan housing including a dust collector attachment, and said ducts being connected with said fan housing.

4. In a structure of the class described, a frame, sanding means on said frame, an electric motor including a housing having an apertured closure at one end, a triple compartment unit on the frame at the opposite end thereof, one compartment constituting a ventilating fan housing, the other compartment a dust collecting fan housing and the intermediate compartment a gear enclosure, a transverse power take-off shaft associated with and mounted in bearings in said triple compartment unit, a gearing connection between the central portion of the power take-off shaft and adjacent end of the motor shaft, said gearing being located in said gear enclosure, fans located on the outer ends of said power take-off shaft and located in the respective fan compartments, one compartment having air inlet means and the other compartment dust intake means, and an operating connection between the power take-off shaft and sanding means.

5. In a structural assemblage of the class described, a portable frame, sanding means carried by said frame, an electric motor on said frame, said motor including a longitudinally arranged power supply shaft and a casing therefor, said casing having an apertured closure at one end, a separate power take-off shaft on said frame, said power take-off shaft extending transversely of the frame and being at right angles to said first named power supply shaft, supporting means for said power take-off shaft, an operating connection between the power take-off shaft and motor shaft, longitudinally spaced independently operable fans on said power take-off shaft, housings for said fans, the fan and housing at one end of the power take-off shaft constituting air blowing and ventilating means for the motor and casing, and the remaining housing and its fan constituting component parts of the dust collecting system associated with the aforementioned sanding means.

6. A portable ventilating sanderplane of the class described comprising a one-piece casting including a base plate, said base plate being formed with an upstanding triple compartment unit, one compartment constituting a ventilating fan housing, the other compartment a dust collecting fan housing and the intermediate compartment a gear enclosure, a transverse power take-off shaft mounted for rotation in bearings in said triple compartment unit, independent fans mounted for rotation on the outer ends of

said power take-off shaft and located in the respective fan compartments, that portion of the power take-off shaft in said gear enclosure being provided with a gear, sanding means mounted on said frame below said plate, an operating connection between the power take-off shaft and sanding means, and an independent bodily attachable electric motor unit mounted horizontally on said base plate and having one end abutting and operatively connected with said triple compartment unit, said motor unit including a motor having a power supply shaft extending into said gear enclosure and provided with a gear in mesh with said first named gear.

7. In a portable ventilated sanderplane of the class described, a frame including a base plate, sanding means supported on said plate, a motor ventilating device carried by said base plate and including an upstanding fan housing of circular configuration having its axial dimension disposed transversely with respect to the longitudinal dimension of said base plate, the rim of said housing being provided with diametrically opposed air passages, an operating shaft mounted for rotation in said fan housing, a fan on said shaft confined in the housing, a motor casing arranged on said base plate and having one end apertured and disposed in abutting relation to said fan housing and formed with air passages in communication with the adjacent air passages in the rim of the fan housing, the other end of said casing being

formed with an apertured closing cap, a motor mounted in the outer end portion of the casing and spaced longitudinally from the inner end of the casing, said motor including a shaft having operating connection with said first named fan shaft.

8. A portable sanderplane of the class described comprising a mobile frame embodying a horizontal base plate formed at its inner end with an integral motor ventilating unit, said unit including a housing rising above said plate, said housing having the requisite air passages for circulation of air therethrough, a rotary bladed fan mounted in said housing for air propulsion purposes, a shaft mounted in said housing, said shaft carrying said fan, sanding means on the frame, an operating connection between said shaft and sanding means, and a renewable motor unit independent of said frame, said unit being placed in a horizontal plane on said plate and including a casing having an internal motor provided with a shaft operatively connected with said first named shaft, said motor casing being provided at its outer end with an apertured cap, the inner end of said casing being formed with air passages and being disposed in abutting relation with said fan housing to cooperate with the apertures in said fan housing for circulating air through the casing.

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