

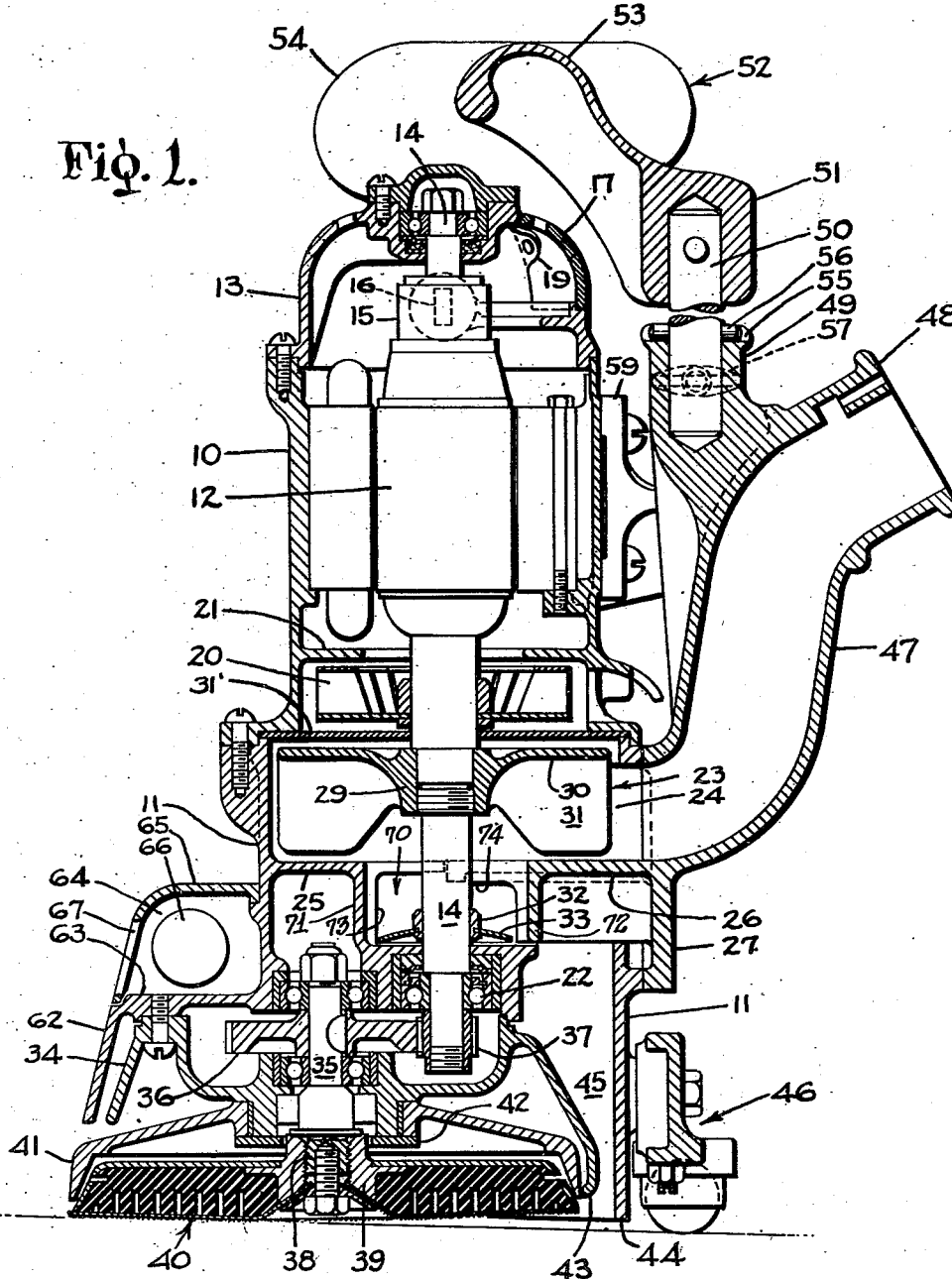
April 19, 1938.

H. L. MYERS
SURFACING MACHINE
Filed May 19, 1936

2,114,966

2 Sheets-Sheet 1

Fig. 1.



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Fig. 3.

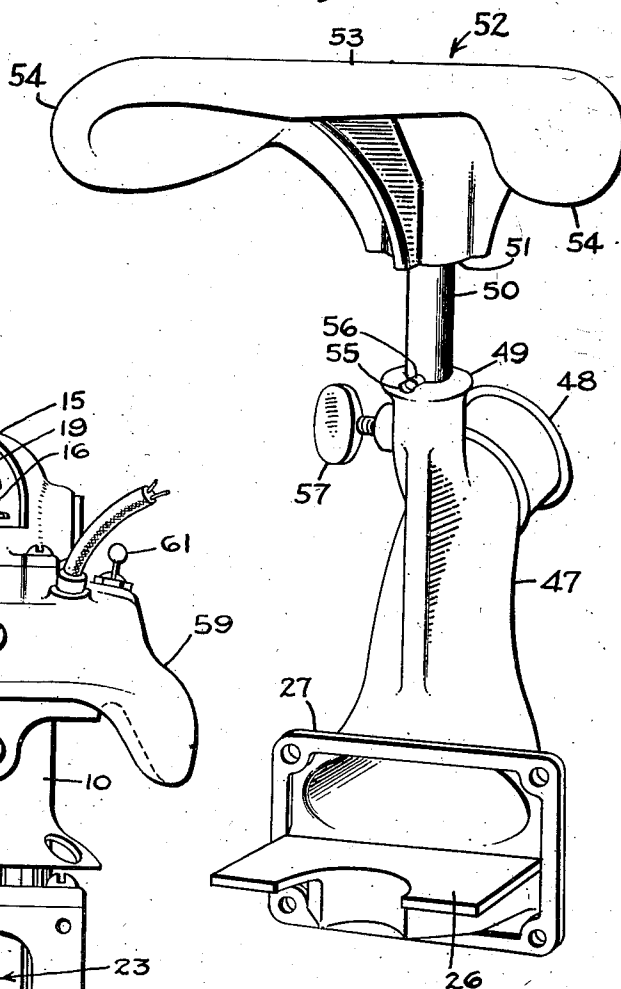
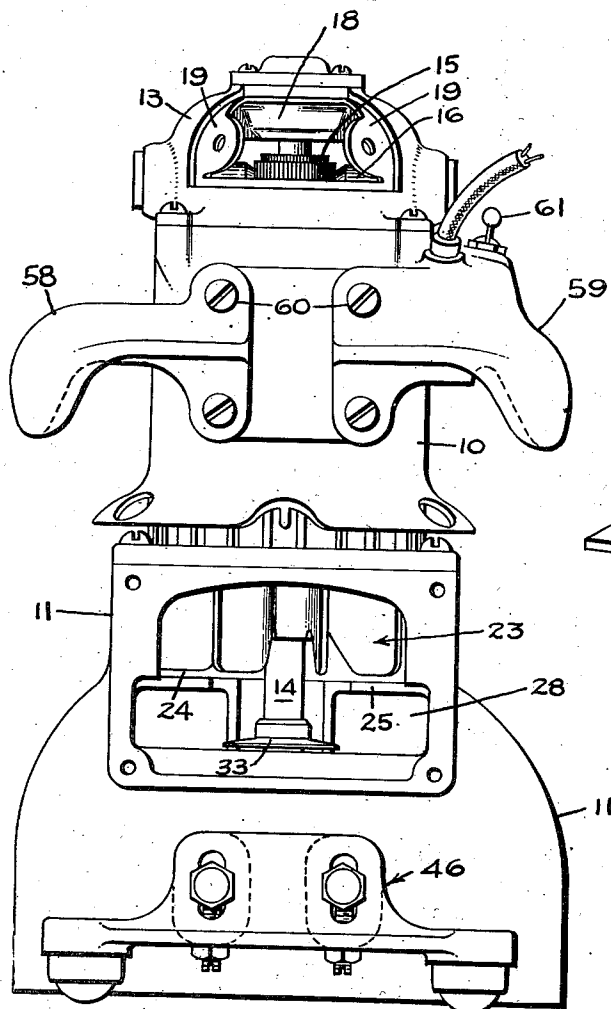


Fig. 2.



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SURFACING MACHINE

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10 Claims. (Cl. 51-177)

This invention relates to improvements in machines for conditioning, finishing or abrading surfaces.

It is an object of the invention to provide a machine of the character designated which adapts itself to more facile handling when in actual use and which is so constructed that cleaning, adjustment, or repair of the various normally concealed working parts may be readily effected. An aim in the present invention has been to provide a machine in which such repairs and adjustment will be required less frequently than heretofore.

A further object is to provide means which permit the operator to more accurately guide the machine upon the surfaces to be finished and with relationship to the limits of the surface to be operated upon.

A machine of the type under consideration is usually provided with a suitable abrading or finishing element driven by an electric motor and it has been previously suggested to place upon the motor the additional task of operating a fan or pump to cause a current of air to move away from the region of the finishing element and carry therewith dust or other fragments of the material to be finished or particles of the finishing element itself. This current of air is usually conducted through or around some portion of the machine and is caused to ultimately deposit this waste material in a suitable receptacle. When working upon surfaces having certain characteristics which result in the adherence and gathering of the waste materials in the fluid current passages, some means for removing or cleaning out such gatherings or obstructions becomes necessary. An instance of this problem is encountered in finishing or abrading floors or other surfaces which have been varnished or where the coating is heavy. The heat generated by the abrading process tends to soften abraded material and make it sticky, which results in a tendency to build up or accumulate upon the parts of the machine with which it comes in contact to such an extent as to seriously impair successful operation of the machine.

I have devised novel means for gaining access to the portions of the machine where this sticking or gathering is most likely to occur and thereby greatly facilitate its removal without in any way decreasing the efficiency or increasing the complexity of the machine, either in construction or operation. The problem presented by this accumulation and removal is further simplified in the present invention by the isolation or localization

tion of the zone in which waste accumulation may occur and of all the instrumentalities immediately involved in the production and disposition thereof.

To facilitate handling of the machine in operation upon surfaces where the clearance above the surface to be treated is restricted and at the same time render its use upon surfaces where such restrictions do not exist more convenient and advantageous, novel gripping or handle means have been provided and these means, together with their mode of incorporation in the general construction of the machine, are features of invention.

The present device is so constructed that the heat generated by the driving motor is more effectively dissipated or conducted out of the machine and this increased efficiency of dissipation, in addition to its obvious benefit to the electric motor, results in the temperature of the machine casing itself being lower. This is particularly true of certain parts of the machine which must be grasped by the user in operating the machine.

The casing of the present machine has been so constructed as to render the driving motor more freely accessible for repair or adjustment. Provision has also been made for preventing the escape of the previously-mentioned waste material from the fluid current passage into the various working parts of the machine. I have provided means associated with the machine in a novel manner for illuminating the surface of the material being treated in the region of treatment and for rendering particularly visible obstacles, obstructions or other physical boundaries which limit or demarcate the area upon which treatment may safely be effected.

In the drawings:

Fig. 1 is a vertical cross sectional view of the machine taken approximately in the plane of its normal movement;

Fig. 2 is a rear elevational view of the machine with portions removed therefrom; and

Fig. 3 is a perspective view of the improved removable suction conduit and guiding or handling means.

The embodiment in which I have chosen to illustrate the principles of my present invention comprises a substantially vertically extending housing or casing made up of a plurality of rigidly connected sections or elements.

In devices of the type of the machine of the present invention, certain of the parts are normally trouble-free and require no attention dur-

ing the life of the machine; others are subject to relatively greater wear or are rendered inefficient by the deposit and accumulation of abraded material or grit and should be readily accessible for cleaning or repair. In view of these facts, I have provided a casing having a body section, indicated at 10 in the drawings, in which is housed an electric motor and a fan for cooling the motor; and a lower or end casing section 11 housing a dust removing fan and the conduits thereto and therefrom, an abrading or finishing disk and the motion transmitting mechanism between the motor shaft and the disk. Not only are these latter mentioned parts which require more frequent attention than the motor in a section separate from the casing of the motor section, but a special construction facilitates access to these parts for adjustment, cleaning and repair.

In the drawings 12 designates generally an electric motor contained in and by the housing or casing portion 10 which is closed at its upper end by a cap or cover member 13 in which is journaled by means of anti-friction bearings the upper end of the motor shaft 14. The motor commutator and brushes 15 and 16 respectively are housed in the cover member 13 and are rendered readily accessible for repair or adjustment by provision of a removable wall portion 17 of the cover member 13. This removable wall portion 17 is conformed to carry out the general shape of the cover member 13 and is supported in an opening 18 in the cover member by means of lugs 19 upon the cover member and projecting into the opening 18. The portion 17 is secured in the opening 18 and upon the lugs 19 by any suitable means such as screws or the like.

Directly below the motor 12 in the casing 10 and mounted upon the motor shaft 14 is a ventilating or cooling fan 20. An annular flange 21 about the interior of the casing 10 extends between the motor 12 and the fan 20 a sufficient distance to guide or direct the current of air downwardly through the motor and cause its zone of greatest velocity to occur at points in the motor where the greatest amount of heat is normally generated.

The skirt member or lower casing portion 11 extends from the bottom of the portion 10 and is detachably secured thereto by screws or the like. The lower end of the motor shaft 14 is journaled in an anti-friction bearing 22 carried by the casing portion 11 and carries an air circulating fan 23 disposed in a chamber or compartment 24 provided in the upper part of the casing portion 11. The bottom of the chamber 24 is partly defined by an approximately semi-circular wall portion 25 formed upon the casing 21 and the remainder of the bottom of the compartment 24 is defined by a complementary wall portion 26 formed upon a cover member 27 which is removably secured over an opening 28 in the casing 11.

The wall portions 25 and 26 have complementary arcuate openings which form a central well 70 whose side walls are formed by complementary depending wall portions 71 and 72 which extend from the wall portions 25 and 26 respectively at their complementary arcuate openings.

The vertical wall portions 71 and 72 are notched as at 73 and 74 respectively to provide open communication between the space lying below the wall portions 25 and 26 but without the transmission gear housing and the fan chamber 24.

The cover member 27 cooperates with the side

walls of the casing portion 11 to form the vertical side walls of the fan compartment 24. The formation of the wall portion 26 integrally with the removable cover member 27 results in its withdrawal from the casing 21 when the cover member 27 is removed and causes a substantially complete laying open of one side of the compartment 24 and of the fluid current conduit which lies beneath it.

The fan 23 consists of a central hub portion 29 having a substantially flat, circular plate or web portion 30 extending radially from a point adjacent its upper edge. Impeller blades 31 are formed integrally with the web portion 30 and depend therefrom across the fan chamber 24. A horizontal partition member 31' is disposed and clamped between the lower edge of the upper casing portion 10 and the upper edge of the lower casing portion 11. The partition 31' forms the upper wall of the fan compartment 24 and effectively separates or closes off the interiors of the casing portions 10 and 11 from each other. By this construction the original manufacture of the component parts and their assembly, as well as subsequent dismantling and reassembly, is greatly facilitated.

Positioned above the anti-friction bearing 22 and about the motor shaft 14 is a collar 32 having a radially and downwardly extending flange 33 which covers or shields the point of entry of the shaft 14 into the casing member 11 and anti-friction bearing 22 against possible entry of dust or other foreign materials. A casting 34 cooperates with the lower portion of the casing 11 to retain a stud shaft 35 which is journaled at its upper and lower ends in the casing 11 and the casting 34 respectively and carries between its bearings a gear 36 which meshes with a pinion 37 positioned upon the motor shaft 14. The stud shaft 35 extends beneath the casting 34 and is provided with a threaded end portion 38 which engages a hub or boss 39 which is part of a discoidal finishing or abrading element indicated generally at 40.

A guard or buffer member 41 is carried by the casting 34 and is held thereon by means of a ring or cap 42. The casting 34 has a portion 43 which extends downwardly and in substantially intimate contact with the buffer member 41. The portion 43 is spaced from a depending portion 44 of the skirt member 11 and the space 45 therebetween defines the lower portion of the fluid current passage. The space 45 has open fluid communication with the fan chamber 24 through the openings 73, 74 formed in the vertical walls 71 and 72 of the central well 70. It is to be observed that this space 45 is conveniently accessible through the opening 28 when the plate 27 is removed and that the removal of any part of the abrading disk 40 and its associated instrumentalities, for cleaning the suction passage to the fan, is rendered unnecessary.

Adjustable elevating or truck members 46 are provided at the rear of the skirt member 11 to facilitate the movement of the machine across the surface to be finished and to permit adjustment of the angular relationship between the face of the finishing member 40 and the surface to be finished.

A fluid current and waste outlet 47 is provided which is integral with the cover member 27 and extends outwardly and upwardly therefrom, terminating in a portion 48 designed to permit ready attachment of a bag or other receptacle for the reception of waste materials. By means of

this construction removal of the cover plate 27 for gaining access to the suction means for cleaning or adjustment thereof will at the same time give convenient access to all of the remainder of the fluid current and waste conduit, i. e., the interior of the conduit 47. The outlet or conduit 47 is provided adjacent its upper end with a socket portion 49 for the reception of a rod member 50 which is secured in a boss 51 provided upon a handle member indicated generally at 52. The preferred form of handle member 52 comprises a relatively narrow center portion 53 which flares outwardly and terminates in enlarged gripping portions 54 at its opposite sides. The conformation of the gripping portions 54 is such that a comfortable and convenient means for handling and guiding the machine is provided and the rod 50 is of sufficient length to avoid unnecessary stooping by the operator in using the machine in places where no unusual limits as to height are present.

The upper surface of the gripping portions 54 forms substantially horizontal lines in the direction of normal movement of the machine and the center portion 53 forms a substantially horizontal line in a direction transversely thereto. The portions 53 and 54 of the handle member 52 thereby provide a substantial portion of a horizontal plane which may be used as a standard or support for the machine in an inverted position for temporary use of the device as a stationary finishing, buffing or abrading machine or for gaining access to the lower portion of the machine for making repairs and adjustments.

A semi-circular depression 55 is formed in the top of the socket portion 49 for the reception of a pin 56 carried by the rod member 50 to prevent turning of the handle portion 52 with respect to the machine. The pin 56 is retained in the depression 55 by means of a set screw 57 which threadedly engages the socket portion 49 and bears against the lower portion of the rod member 50.

The handle portion 52 is designed and proposed to normally project above the top of the machine proper but in many cases height limitations are such as to prohibit use of the machine while the handle member is in this position. Removal of the handle member 52 is rendered simple and facile by its means of association with the machine, as has just been described, and auxiliary handle members are provided for manipulation of the machine when the handle member 52 has been removed. These auxiliary handle members are designated 58 and 59, are similar in the conformation of their gripping portions to the gripping portions 54 of the handle member 52, and are rigidly secured against the body section 10 as by screws 60. One of the handle members 59 may be provided with a switch 61 within convenient reach of the fingers of the operator, for controlling the driving motor 12.

It is to be noted that the handle means 52 is mounted in such manner that, while it is conveniently located above and adjacent the top of the motor housing, it has no direct contact with the motor housing. This construction avoids conduction of heat directly to the handle from the motor casing and makes for greater convenience of operation.

In machines of the type herein disclosed, where the surfacing disk is mounted eccentrically to its driving motor, the disk usually projects from the general confines of the casing portions at its front or leading edge. When this portion of the disk is

not confined or housed the working portion of the disk may be observed and accurately positioned with respect to the work. The casing 11 of the present invention has been so constructed that, while the disk and the parts cooperating with it are substantially completely housed and protected, it does not disturb the power of the user to observe and guide the working edge but actually assists him in that direction. To this end the forward or leading skirt portion 62 of the lower casing portion 11 has been disposed and inclined so that it is substantially coincident with a line drawn from the forwardmost edge of the disk to the point from which the average operator will view the operation of the machine.

To further aid the operator in effectively limiting or localizing the application of the rotatable disk to the surface, and in particular when working in poorly illuminated places, such for example as closets, stairways, and the interior of vats, I have found it desirable to provide illuminating means for this sighting device.

Above the skirt portion 62 the casing member 11 has a receding shelf or ledge portion 63 at its forward or leading side. The shelf or ledge 63 and the vertically extending portion of the casing 11 directly behind and above it cooperate to form two sides of a chamber 64 which is completed by a cover member 65 and carries within its confines an illuminating means in the form of a lamp 66. The inclination of the front wall of the cover member 65 is such that it extends and carries out the "sight-line" formed by the portion 62 of the casing 11. An opening or openings 67 are provided in the front portion of the cover member 65 for emission of light from the lamp 66 in such manner and direction that the surface to be treated is illuminated in the zone immediately preceding the surface presently being operated upon and so that special and particular illumination of restricting boundaries such as baseboards, shoe strips, wainscoting and walls will result. The manner of illumination and the disposition of the means therefor in the present invention emphasize the lower part of the "sight-line" leading from the eye of the operator to the extreme working edge of the disk.

While the principles involved in the present invention have been described and expressed in connection with a single specific form of finishing or abrading machine, it is, of course, to be understood that their application is not limited thereto or in any way excepting as defined in the appended claims.

I claim:

1. A unitary, manually-portable surfacing machine having a housing member containing a driving motor and a motor cooling fan, an end casing member attached to said housing member and containing a surfacing member, motion transmitting means for operatively connecting said surfacing member with the driving motor, and suction means including a fan and a compartment formed in said end casing member for receiving the fan; a portion of the side and bottom walls of said compartment being formed by an integral independently removable member.

2. In a unitary, manually-portable surfacing machine, an upper casing section formed with a substantially open bottom and a lower casing section formed with a substantially open top, said casing sections being detachably secured to each other, a motor disposed in said upper section and a surfacing element disposed in said lower section, means for transmitting motion from said

motor to said surfacing element, an air displacing fan in one of said casing sections at the end adjacent the other casing section and a partition member held between the upper and lower casing members and dividing the motor section from the lower section.

3. In a unitary, manually-portable surfacing machine, an upper casing section formed with a substantially open bottom and a lower casing section formed with a substantially open top, said casing sections being detachably secured to each other, a motor disposed in said upper section and a surfacing element disposed in said lower section, means for transmitting motion from said motor to said surfacing element, an air displacing fan in the upper part of said lower section and a partition member held between said upper and lower casing sections to separate their interiors.

4. In a unitary, manually-portable surfacing machine, a casing portion formed with an open bottom, a vertically disposed motor and a motor cooling fan on the shaft of said motor adjacent the open bottom of said casing, said casing having an integral, inwardly projecting substantially circular flange between said motor and said motor cooling fan and overlying a substantial portion of said fan adjacent said motor whereby the major portion of the air displaced by the fan is directed and induced to flow across the source of heat generated by said motor in its operation.

5. In a unitary, manually-portable surfacing machine, an upper casing portion formed with an open bottom, a lower casing portion formed with an open top, a motor in the upper casing and a motor shaft extending from said motor into the lower casing, a motor cooling fan upon the motor shaft and in said upper casing portion, an inwardly projecting flange in said upper casing extending between said motor and said motor cooling fan and substantially overlying the outer portions of said motor, a dust collecting fan in the top of the lower casing, a rotary surfacing disk and motion transmitting means in said lower casing, a partition between the dust collecting fan and the motion transmitting means, and means for detachably securing said upper and lower casing portions to each other.

6. In a unitary, manually-portable surfacing machine, an upper casing portion formed with an open bottom, a lower casing portion formed with an open top, a motor in the upper casing and a motor shaft extending from said motor into the lower casing, a motor cooling fan upon the motor shaft and in said upper casing portion, an inwardly projecting flange in said upper casing extending between said motor and said motor cooling fan and substantially overlying the outer portions of said motor, a dust collecting fan in the top of the lower casing, a rotary surfacing disk and motion transmitting means in said lower casing, a partition between the dust collecting fan and the motion transmitting means, and means for detachably securing said upper and lower casing portions to each other,

said lower section having a substantial peripheral opening adjacent the dust collecting fan and a removable wall portion for closing said opening.

7. In a unitary, manually-portable surfacing machine, an upper casing portion formed with an open bottom, a lower casing portion formed with an open top, a motor in the upper casing and a motor shaft extending from said motor into the lower casing, a motor cooling fan upon the motor shaft and in said upper casing portion, an inwardly projecting flange in said upper casing extending between said motor and said motor cooling fan and substantially overlying the outer portions of said motor, a dust collecting fan in the top of the lower casing, a rotary surfacing disk and motion transmitting means in said lower casing, a partition between the dust collecting fan and the motion transmitting means, and means for detachably securing said upper and lower casing portions to each other, said lower section having a substantial side opening, and a substantially tubular member having means for securing one of its ends over said opening and adapted to provide a dust discharge conduit from said dust collecting fan.

8. In a unitary, manually-portable surfacing machine, an upper casing section formed with a substantially open bottom and a lower casing section formed with a substantially open top, said casing sections being detachably secured to each other, a motor disposed in said upper section and a surfacing element disposed in said lower section, means for transmitting motion from said motor to said surfacing element, an air displacing fan in each of said casing sections at the end adjacent the other casing section and a partition member held between said casing sections and separating said air displacing fans.

9. In a unitary, manually-portable surfacing machine having attached upper and lower casing portions, a motor in said upper casing portion having a substantially vertical axis and a discoidal finishing element in said lower casing portion and adapted to be rotated by said motor in a substantially horizontal plane, a waste discharge conduit extending from said lower casing portion and spaced from said upper casing portion, and handle means adjacent the top of the upper casing portion and supported independently thereof by said waste discharge conduit.

10. In a unitary, manually-portable surfacing machine having attached upper and lower casing portions, a motor in said upper casing portion having a substantially vertical axis and a discoidal finishing element in said lower casing portion and adapted to be rotated in a substantially horizontal plane by said motor, a waste discharge conduit extending from said lower casing portion, handle means adjacent the upper casing portion and out of contact therewith, and means on said waste discharge conduit for supporting said handle means for ready detachment therefrom.

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