S. K. BROWN.

SURFACE FINISHING MACHINE.

APPLICATION FILED MAR. 24, 1917.

1,276,167.

Patented Aug. 20, 1918.

3 SHEETS—SHEET 1.

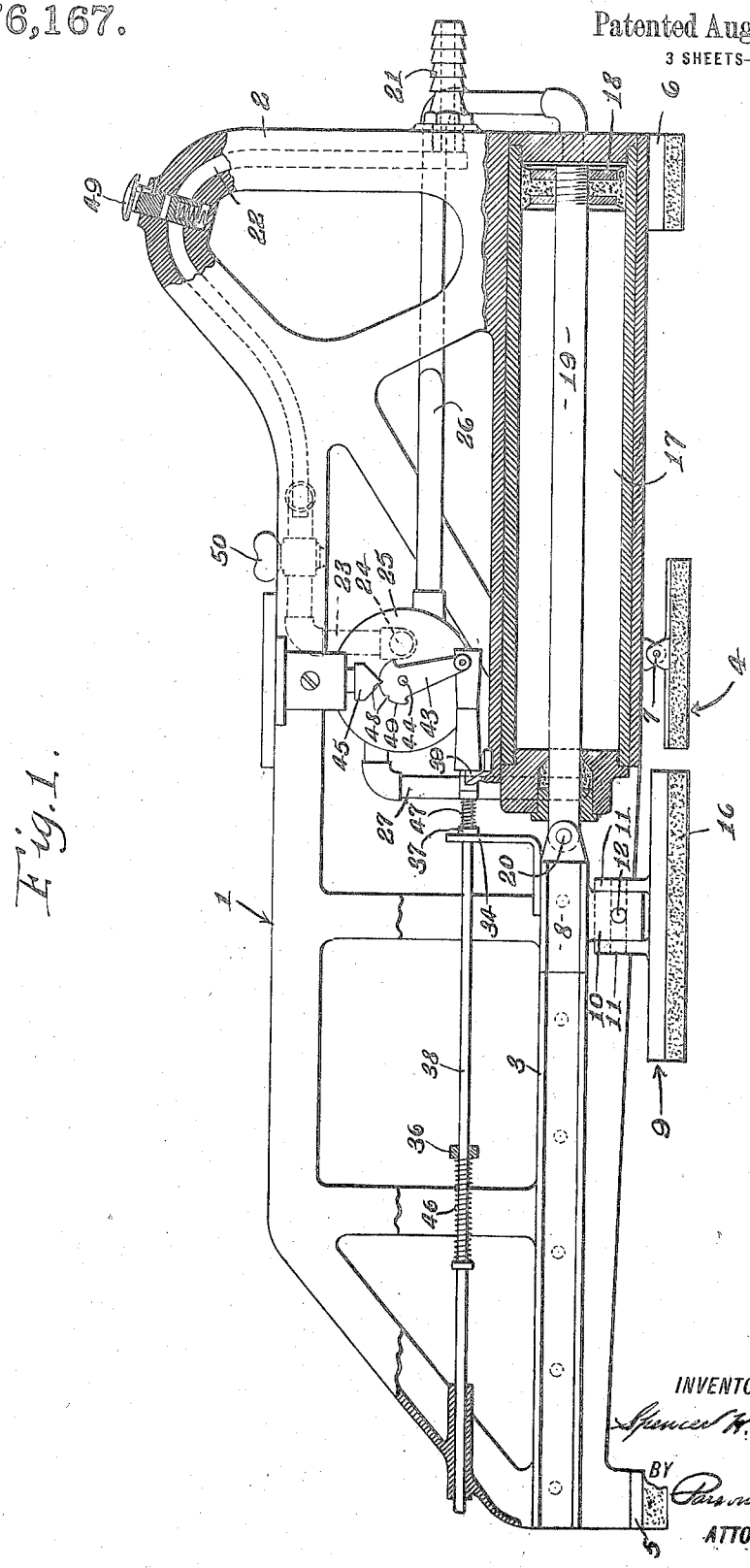


Fig. 1.

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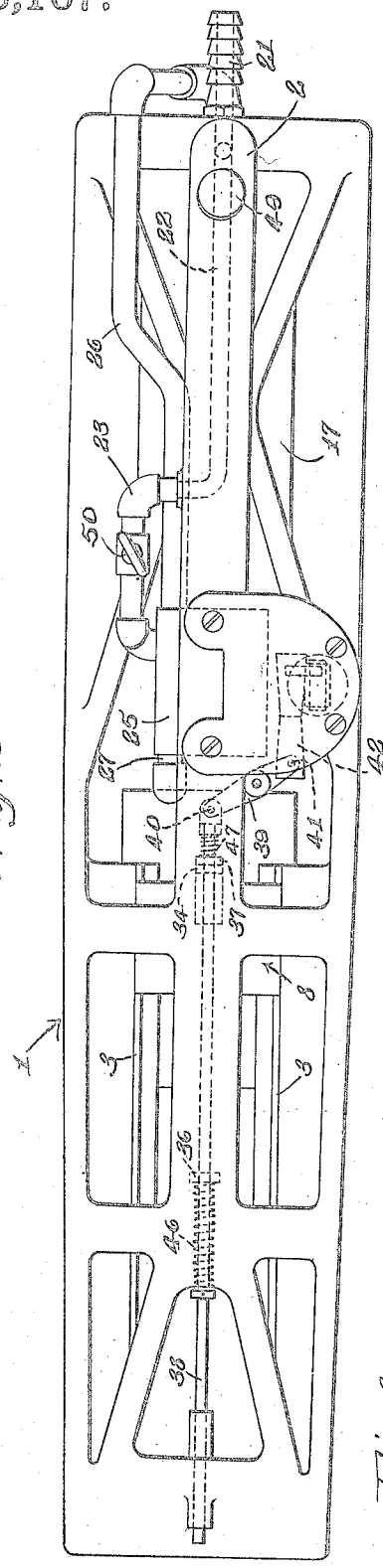


Fig. 2.

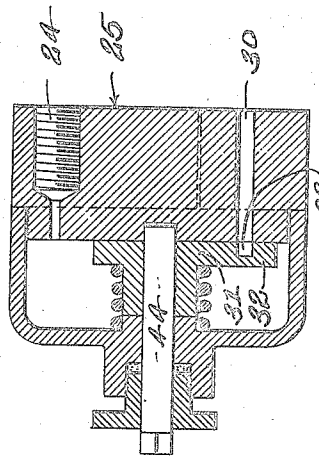


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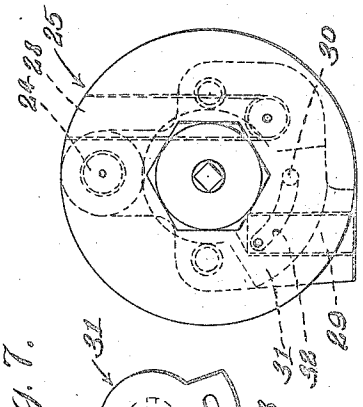


Fig. 5.

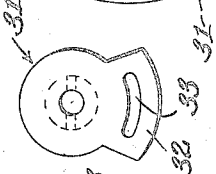


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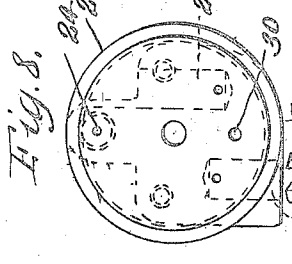


Fig. 8.

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3 SHEETS—SHEET 3.

Fig. 4.

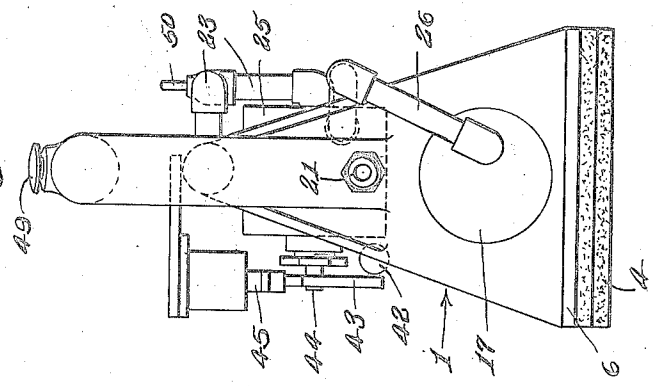


Fig. 5.

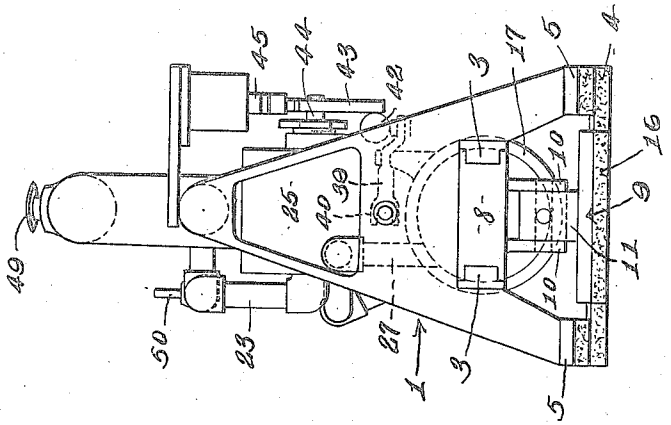


Fig. 10.

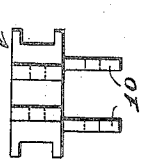


Fig. 12.



Fig. 14.

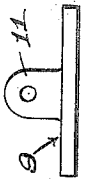


Fig. 9.

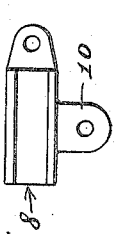


Fig. 11.

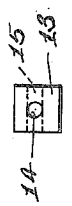
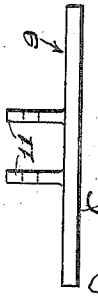


Fig. 13.



INVENTOR

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UNITED STATES PATENT OFFICE.

SPENCER K. BROWN, OF SYRACUSE, NEW YORK.

SURFACE-FINISHING MACHINE.

1,276,167. Specification of Letters Patent. Patented Aug. 20, 1918.

Application filed March 24, 1917. Serial No. 157,102.

To all whom it may concern:

Be it known that I, SPENCER K. BROWN, a citizen of the United States, and a resident of Syracuse, in the county of Onondaga and State of New York, have invented a certain new and useful Surface-Finishing Machine, of which the following is a specification.

This invention has for its object the production of a machine tool for finishing or rubbing surfaces by which the rubbing motion is similar to the hand operation now used by workmen when rubbing a surface as when rubbing down paint and varnish; and the invention consists in the features and in the novel combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

Figure 1 is a side elevation, partly in section, of a machine or tool embodying my invention.

Fig. 2 is a plan view thereof.

Figs. 3 and 4 are opposite end elevations.

Figs. 5 and 6 are, respectively, an end elevation, and a sectional view through a portion of the valve mechanism.

Figs. 7 and 8 are respectively, a face view of the valve and the part of the casing with which the valve coacts.

Figs. 9 and 10 are, respectively, side and end elevations of the carriage for the abrading member.

Figs. 11 and 12 are elevations taken at a right angle to each other, the block of the universal joint connecting the carriage and the abrading member.

Figs. 13 and 14 are side and end elevations of the body of the abrading member.

This machine tool comprises an abrading member, or tool supported by the body, and means on the body for moving the tool over the surface being finished in a direction parallel to the plane of the working face of the tool.

In this embodiment of my invention the body is provided with means by which it rests upon the surface being finished, and the tool reciprocates relatively to the body and is movably connected to its support by a rocking connection.

1 designates the body which may be of any suitable form, size and construction, it being here shown as provided with a handle 2 and with a guide 3 extending lengthwise of the front portion thereof, the guide 3 consisting of spaced apart parallel bars running lengthwise of the body on opposite sides of its center. The means on the body for resting on the surface being finished, in this embodiment of my invention includes the foot 4 located between the ends of the body and additional feet or rests 5 and 6 at the opposite ends of the body, there being two rests or feet 5 at the front corners of the body, and one rest 6 which extends the full width of the rear end of the body. The rests or feet are provided on their lower faces with suitable yielding material as cork or felt which will not mar the surface.

The surface of the foot 4 is arranged in a lower horizontal plane than the under surface of the rests 5 or 6 and said foot or rest 4 is connected to the body 1 by a transverse horizontal pivot 7. Thus the body can tilt about the axis 7 and raise or lower the abrading member relatively to the surface being rubbed.

8 designates the carriage movable along the guides 3, and 9 is the abrading member supported by the carriage, the carriage 8 being provided with downwardly depending lugs 10, and the abrading member 9 having upwardly extending lugs 11, these lugs 10 and 11 forming part of a universal joint which also includes a block 13 located in the rectangular space confined by the lugs 10 and 11 and into which pivot pins pass, one of the pins 12 extending through the lugs 10 and into a transverse opening 14 in the block 13 and the other pivot extending through the lugs 11 and into a similar transverse opening 15 in the block, at the angle to the first mentioned opening 14. The abrading member 9 is provided with a suitable rubbing material 16 as felt or cork.

The abrading member 9 is operated or reciprocated by fluid or compressed air operating means carried by the body 1, said means consisting of a cylinder 17 arranged in the rear of the guide 3 and in line therewith, a piston 18 movable in the cylinder and having a rod 19 pivoted at 20 to the carriage 8, inlet and outlet pipes and valve mechanism for controlling the inlet and the outlet of the air to the opposite ends of the cylinder.

21 designates the intake pipe which is coupled to a compressed air supply, the pipe 21 communicating with a passage 22 extending through the handle 2 and con-

nected with a pipe 23 communicating with the port 24 of a valve casing 25 in which is located mechanism for controlling the flow of the air alternately into opposite ends of the cylinder 17 and the exhausting of the air, from the opposite sides of the piston.

26 is a pipe leading from the casing 25 to one end of the cylinder 17.

27 is a pipe leading from the casing 25 to the other end of the cylinder 17.

The mechanism within the casing 25 controls the opening of the pipes 26, 27 both for conveying motive fluid to the cylinder and for exhausting the air from the cylinder.

The casing 25 is provided with two passages 28, 29 to which the pipes 26, 27 are connected respectively, and also with a single exhaust passage 30. The valve mechanism for controlling the flow of air from the passages 28, 29 and the exhaust 30 includes an oscillating valve member 31 located in the casing 25 and having a segment portion 32 arranged to cover up one of the openings 28 or 29 and the exhaust passage 30 while the other passage 28 or 29 is left open, the segment being also formed with a groove or by pass 33 therein, arranged to connect the passage 28 or 29 covered thereby and the outlet 30. When this valve 31 moves to uncover the port 28, the air which has entered the casing 25 through the pipe 21 and port 24 passes through the passage 28, pipe 26 to the right hand end of the cylinder moving the piston to the left and the segment 32 cuts off the port 29 from the interior of the casing 25 and connects said port 29 with the outlet 30 so that the air exhausts from the left side of the piston 18 through the pipe 27, passage 29, groove 33, and outlet port 30.

When the piston 18 reaches the limit of its throw to the left the valve 31 is oscillated as will be hereinafter described opening the passage or port 29 to the interior of the casing 25 and closing the port 28 from said casing 25 and connecting the same by means of a groove 33 to the exhaust 30 so that the air passes from the casing 25 to the pipe 27 to the left end of the cylinder and actuates the piston to the right. The air now exhausts through the pipe 27, port 28 and groove 33 and exhaust port 30.

The valve 31 is operated or oscillated in any suitable manner, in order to effect quick operation thereof, and as here shown, it is operated from the carriage 8 by means of an arm 34 on the carriage 8 movable into and out of engagement with opposing spring pressed shoulders 36 and 37 slidable on a rod 38 and a lever 39 pivoted between its ends and connected at one end at 40 to the rod 38 at its other end to 41 to a link 42 connected to a rock arm 43 mounted on the shaft 44 of the valve 31. This rock arm 44 is held in its shifted position by a spring pressed puppet or other friction device 45 and the compression or holding force of this puppet must be overcome before the valve can be shifted. The holding force of the puppet is not overcome until the spring 46 or 47 acting on the shoulders 36 or 37 has compressed to a predetermined extent. These springs are interposed between the shoulders 36, 37, and fixed shoulders on the rod 38.

The device 45 is provided with a wedge shaped edge for coacting with the inclined sides of notches 48 on the segment 49 on the arm 43 and the force applied to shift the arm 43 must be sufficient to force the inclined sides of the puppet out of engagement with the inclined sides of the notches 48.

In operation, as the carriage travels to the right, the arm 34 engages the shoulder 37 compress the spring 47 until the spring 47 has been tensioned sufficiently to cause the incline of the notches 48 to force the puppet 44 outwardly, and thus the valve oscillates quickly to change the direction of the flow of air from one end of the cylinder to the other and during the movement of the carriage 8 to the left the arm 34 engages the shoulder 36 and likewise tends to shift the arm 43 and the valve 31.

The air is controlled by means of a hand or thumb operated valve 49 on the handle 2, and also the pipe 25 is provided with a hand operated valve 50.

This tool is particularly advantageous in that in its operation it simulates the hand operation used in finishing surfaces, and such as the rubbing down of automobile bodies can be done as efficiently as by hand and more quickly and economically.

What I claim is:

1. A surface finishing tool comprising an elongated body, an abrading member movable in the front portion thereof and means for actuating the abrading member arranged in the rear portion of the body, and a rest arranged between the ends of the body and in the rear of said member, the rest being pivotally connected to the body to permit the body to have a rocking movement relatively thereto, substantially as and for the purpose described.

2. A surface finishing tool comprising an elongated body formed with a guide extending lengthwise of the forward portion thereof, a reciprocating abrading member having a carriage movable along the guide, means for actuating the abrading member arranged lengthwise of the rear portion of the body in alinement with the guide, and a rest arranged between the ends of the body and in the rear of the path of said member, the rest being pivotally connected to the body

to permit the body to have a rocking movement relatively thereto, substantially as and for the purpose set forth.

3. A surface finishing tool comprising a body formed with a guide extending lengthwise of the forward portion thereof a reciprocating abrading member moving a carriage movable along the guide, means for actuating the abrading member arranged lengthwise of the rear portion of the body in alinement with the guide, and rests at the front and rear end of the machine arranged with their bottom faces in planes above the plane of the face of the abrading member, and a foot arranged between the ends of the body and at the rear end of the path of the abrading member, the foot being pivoted to the body to permit the body to have a rocking movement forwardly and rearwardly, substantially as and for the purpose set forth.

4. A surface finishing tool comprising a body formed with a guide extending lengthwise of the forward portion thereof, a reciprocating abrading member having a carriage movable along the guide, the abrading member and the carriage being connected by a universal joint, means for actuating the abrading member, arranged lengthwise of the rear portion of the body in alinement with the guide, rests at the front and rear end of the machine arranged with their bottom faces in planes above the plane of the work face of the abrading member, and a foot arranged between the ends of the body and at the rear of the path of the element, the foot being pivoted to the body to permit the body to have a rocking movement forwardly and rearwardly, the bottom face of the foot being located in substantially the plane of the working face of the abrading member, substantially as and for the purpose described.

In testimony whereof I have hereunto signed my name, at Syracuse, in the county of Onondaga, and State of New York, this 23rd day of March, 1917.

SPENCER K. BROWN.