July 24, 1951 H. S. NEWTON 2,561,589

SWING SANDER

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Fig. 1

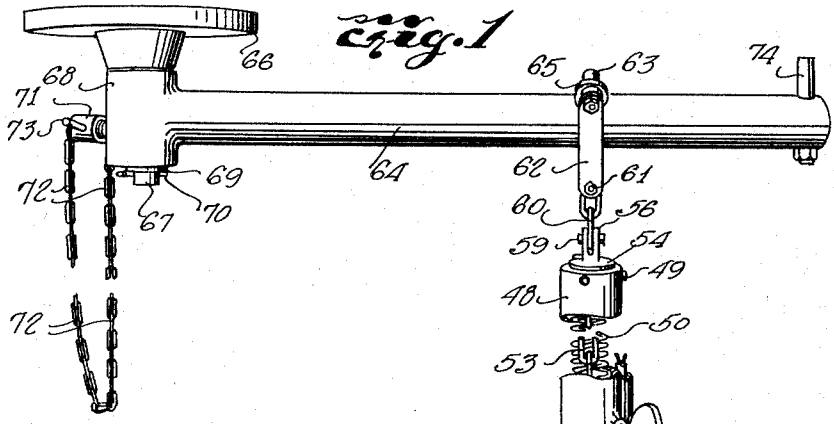


Fig. 7A.



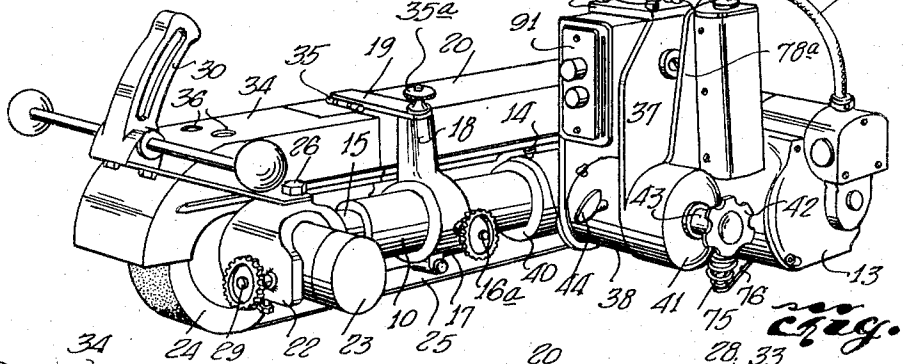
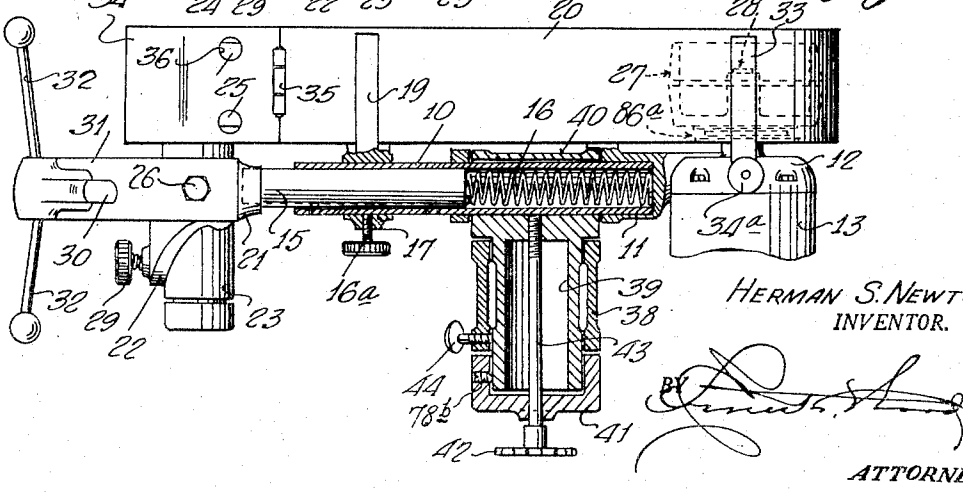


Fig. 7



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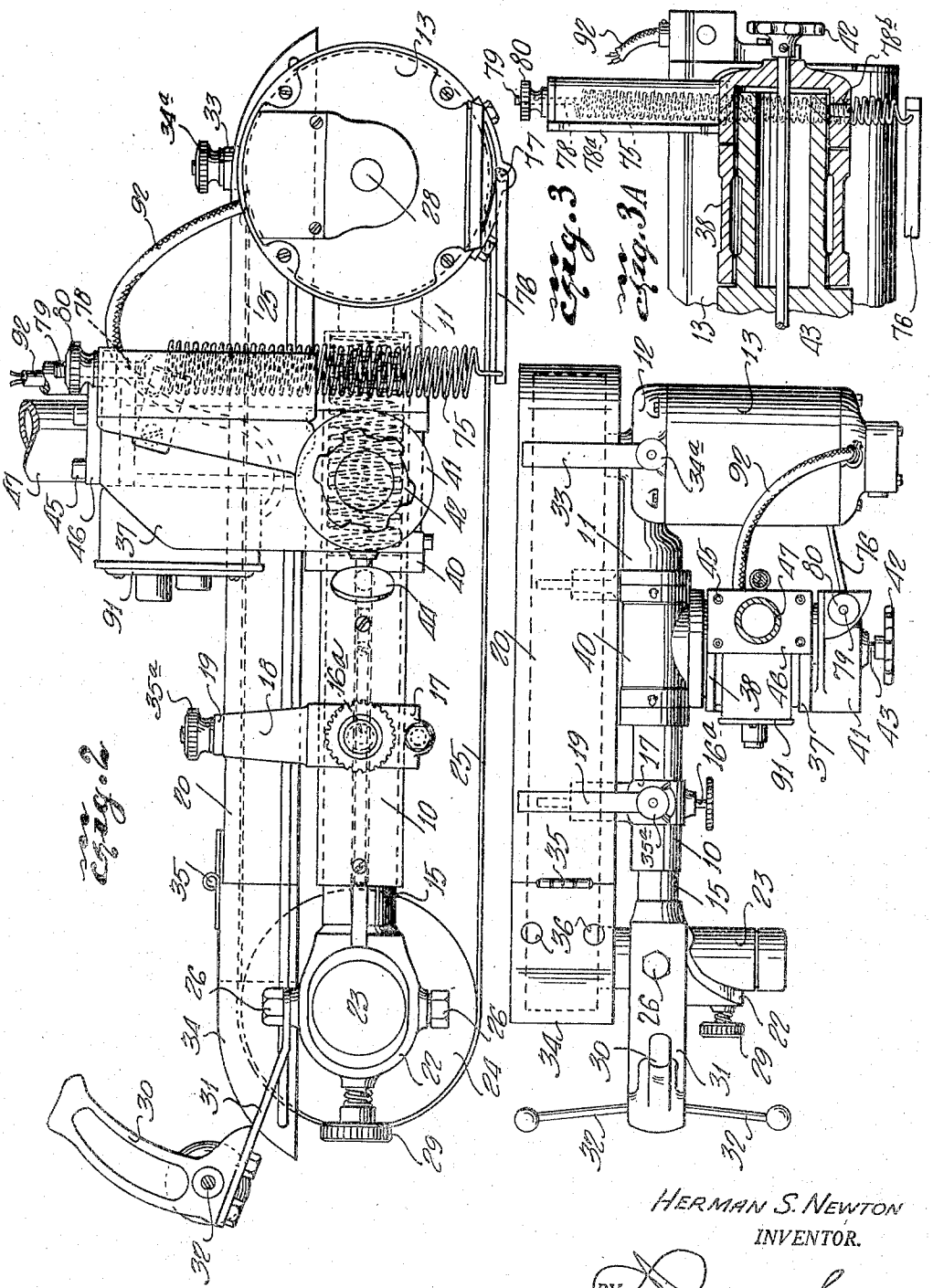


Fig. 2

Fig. 3

Fig. 3A

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Fig. 4

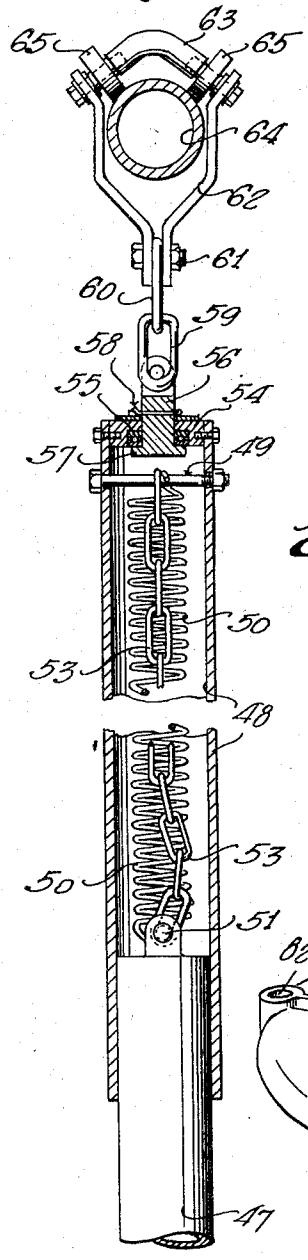


Fig. 5

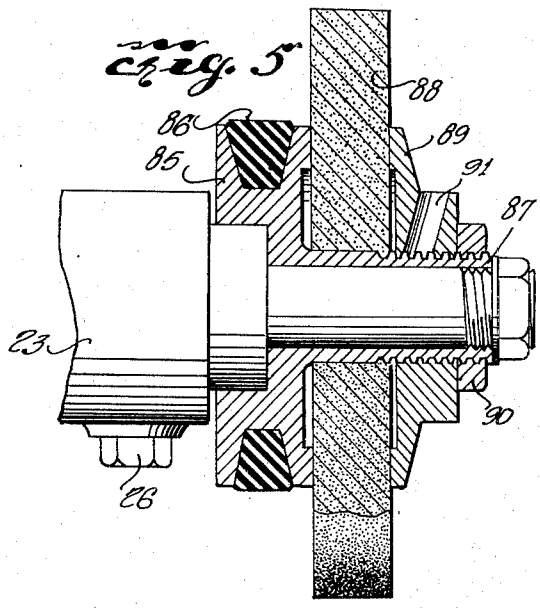
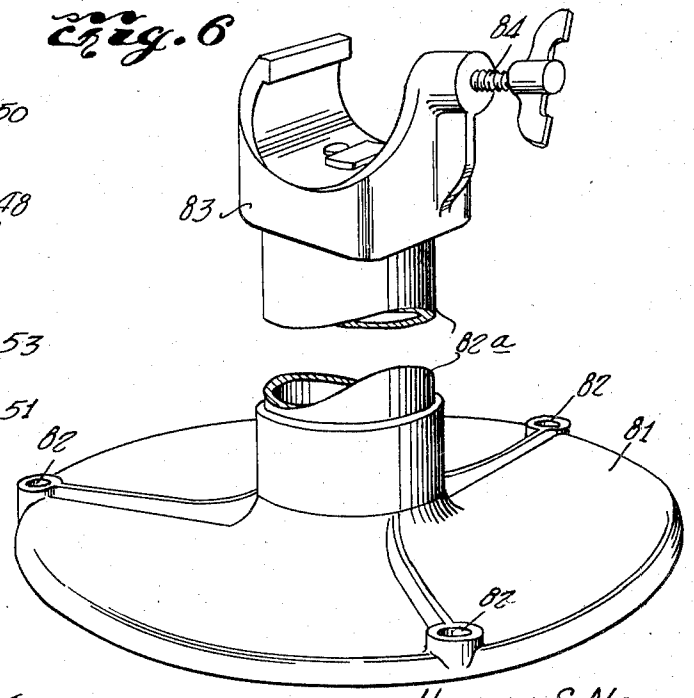


Fig. 6



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2,561,589

SWING SANDER

Herman S. Newton, Temple, Tex., assignor to Vonnegut Moulder Corporation, Indianapolis, Ind.

Application September 25, 1948, Serial No. 51,235

1 Claim. (Cl. 51—147)

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This invention relates to polishing, abrading and sanding machines and more particularly to such a machine adaptable to wood and metal working.

The principal object of the invention is to broaden the scope of operations of the sanding machine described in U. S. Letters Patent No. 2,416,493 issued February 25, 1947, in which the objects are: to provide an all purpose sanding machine, in the sense that it possesses interchangeable facilities by which it may be converted into a belt sander, grinding machine and buffing machine. The present invention augments the objects of the aforesaid patent through and by virtue of a novel form of ceiling suspension having a radial arm for greater working latitude, the suspension being flexible to lend freedom of movement to the machine and increasing flexibility.

Another object of the invention is to provide a sanding machine which is so connected to its suspension means that it can be rotated about its longitudinal axis in order to perform on work ordinarily difficult of access.

Another object of the invention is to provide a spring counterbalance for returning the machine automatically to a normally horizontal position from any one of several angular working positions. Moreover, the invention provides a spring counterbalance in the vertical suspension column, the latter being likewise equipped with means for effecting vertical adjustment of the machine as well as a normally relaxed flexible means as a safety feature to intercept the fall of the machine in event of failure of the spring suspension counterbalance.

With the foregoing objects in view, the invention has further reference to certain features of accomplishment which will become apparent as the description proceeds, taken in connection with the accompanying drawings wherein:

Figure 1 is a perspective view of a radial swing sanding machine and suspension, constructed according to the present invention.

Figure 2 is a side elevational view.

Figure 3 is a plan view on a slightly reduced scale.

Figure 3A is a fragmentary view partly in section showing the relationship of the machine counterbalancing spring with the motor.

Figure 4 is a fragmentary view of the suspension column partly in longitudinal cross-section to reveal the ceiling spring counterbalance and safety suspension chain.

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Figure 5 is a fragmentary view of the grind wheel adapter partly in vertical section.

Figure 6 is a perspective view of the floor stand per se with a portion of its midsection cut away.

Figure 7 is another plan view, partly in section to reveal the sanding belt tensioning spring and angle adjustment clamp, and

Figure 7A is a detail view of one of the two straps by which the sanding belt guard is secured.

Continuing with a more detailed description of the drawing, reference numeral 10 denotes a tubular body portion, one end of which enters the core of a boss 11 cast integral with a support 12 for the motor 13. The member 10 is secured against displacement with respect to the boss 11 by a set screw 14. The opposite end of the tubular body member 10 telescopically receives a complementary body member 15 (Fig. 7) against which bears at one end, a coil spring 16 housed in the member 10, to exert a force tending to urge the complementary member 15 out of the member 10 but is restrained by a set screw 16a, passing through a split collar 17, surrounding the member 10 and on which is a bracket 18, carrying a lateral arm 19 which latter, in turn, supports a sanding belt guard 20, to which further reference will be made presently.

The outer end of the complementary body member 15 enters a boss 21 formed on a yoke 22, the latter embracing a spindle bearing 23, in which is journaled the spindle which carries a pulley 24 on which the sanding belt 25 is mounted. The bearing sleeve 23 is connected to the yoke 22 by opposed pivots 26 above and below the latter (Fig. 2) so that the angle of the spindle may be changed in relation to the longitudinal axis of the machine body to insure true tracking of the belt 25 on the pulleys 24 and 27, the latter pulley being mounted on the shaft 28 of the motor 13 (Fig. 7). The means for accomplishing this is in the form of an adjusting screw 29 threaded through the yoke 22 to bear against the bearing sleeve 23 in offset relation to the pivotal points 26.

A manipulating handle 30 is attached to the top of the yoke 22 through the medium of an angular arm 31 which is secured by means of the upper pivot bolt 26. Auxiliary hand grips 32 are arranged on each side of the handle 30 to facilitate rotation of the machine about its longitudinal axis.

The belt guard 20 is held in position over the sanding belt 25 by the lateral arm 19, previously mentioned and a companion arm 33 (Figs. 3 and 7) attached to the motor support 12. The arm 33, as well as arm 19 is provided with a slotted

aperture 33a to receive a thumb screw 34a by which it is secured to the motor support 12 for lateral displacement. In like manner, arm 19 is secured to the bracket 18 by a thumb screw 35a. The forward section 34 of the guard 20 is hinged at 35 so that it may be raised to accommodate a grinding wheel (Fig. 5) replacing the belt and pulley 24, and yet afford a shield against grindings when applying work to the wheel. Further reference to the grinding wheel and its mode of attachment will be made presently. Peep holes 36 are provided in the hinged portion 34 of the belt guard 20 as in Figures 1, 3 and 7 through which the belt 25 may be seen to determine proper tracking thereof on pulleys 24 and 27.

The structure described in the foregoing is substantially the same as that set forth in U. S. Letters Patent Nos. 2,416,493 and 2,452,206. The following description will set forth in detail the improvements sought to be embraced by the claims of this application.

To lend flexibility to the described machine and to enlarge its range of operations, a form of suspension therefor is shown in Figures 1 and 4. A bifurcated casting 37 is formed with a sleeve 38 on its lower end, which sleeve embraces a tubular bearing 39 (Fig. 7) formed on a collar 40, which latter, in turn, embraces the tubular body section 10. A cap 41 is formed on the outer leg of the bifurcated casting 37 which receives the outer end of the tubular bearing 39 and through the medium of a hand wheel 42, a set screw 43, extending axially through the bearing 39 and threaded into the collar 40, is caused to bear against the tubular body section 10 and secure the entire machine against rotation about its longitudinal axis or to hold the same in adjusted angular positions with respect to the longitudinal axis thereof.

The relationship of the sleeve 38 and bearing 39 enables the machine to be oscillated on the bearing to dispose the same in an inclined plane. A set screw 44 secures the machine in adjusted inclined positions.

Secured to the top of the casting 37 by bolts 45 is a plate 46 and to this plate is affixed a suspension column for the machine consisting of a pipe 47. Telescopically receiving the upper end of the pipe 47 is a tube 48 (Fig. 4). A transverse bolt 49 passes through the tube 48 at its upper end and to this bolt is attached the upper end of a coil spring 50, the lower end thereof being secured at 51 to the upper end of the pipe 47 within the tube 48. Thus, the machine is suspended for vertical movement by the spring 50, which movement may be prohibited by means of a set screw 52 (Fig. 1) passing through the tube 48 adjacent the lower end and engaging the column 47.

To prevent damage of the machine by falling in event of breakage of the spring suspension 50 or failure of its connections, a link chain 53 is also housed in the tube 48 with its upper end connected to the bolt 49 and its lower end joined to the upper end of column 47 at 51. The chain is normally relaxed and is effective to support the machine only in event of failure of the spring 50.

Installed in the top of the tube 48 is a plug 54, recessed to retain a ball bearing 55. A bifurcated member 56 has a shank extending through an opening in the plug 54 and is provided with a head 57 on which rests the bearing 55 to support the entire assembly therebelow for unrestricted rotation. A cotter key 58 prevents longitudinal displacement of the bifurcated suspension member 56.

In the bifurcated upper end of member 56 is a pin 59, to which is attached a short length of chain 60, the upper end of the latter being connected at 61 to a yoke 62. The arms of the yoke are connected to the ends of an inverted V-shaped hanger 63 overlying a radial suspension arm 64 and on which is mounted a pair of spaced apart rollers 65 by which the hanger is moved effortlessly along the arm 64 for radial displacement of the machine suspension with respect to a ceiling support consisting of a mounting plate 66 having a depending shaft 67 (Fig. 1). A collar 68 attached to the end of the suspension arm 64 embraces the shaft 67 and is held rotatably thereon by means of a washer 69 and a cotter key 70.

To hold the arm 64 in adjusted positions, a set screw 71 is threaded through the collar 68 to bear against the shaft 67 and is actuated by an operator standing on the floor through a chain 72 whose ends are connected to a transverse pin 73 extending through the head of the set screw 71. A stop 74 at the outer end of the radial suspension arm 64 prevents the yoke 62 and hanger 63 from rolling off the end of the arm.

Returning now to the counterbalancing features of the machine itself, reference is made to Figures 1 and 2 particularly in which is shown a coil spring 75, the lower end of which is connected to the outer end of an arm 76. The opposite end of this arm is pivotally connected at 77 (Fig. 2) to the bottom of the motor 13 to oscillate about a vertical axis. The upper end of the spring 75 is connected to a hanger 78 shown in dotted lines in Figure 2 as being a part of the lower end of a tension adjusting screw 79. A knurled nut 80 is provided for longitudinally moving the screw 79 to increase or decrease the tension on spring 75.

The hanger 78 is stationary with respect to the sleeve bearing 39, due to the fact that the hanger is mounted on an arm 78a which is an integral part of the cap 41 and which cap is secured to the sleeve bearing 39 by means of a set screw 78b (Fig. 7).

The object in so arranging the spring 75 is to enable the machine to be rotated about its horizontal and transverse axis about its bearing 39 to an angle of 90 degrees to the right and approximately 45 degrees to the left as viewed in Figs. 1 and 2 without sacrificing any of the counterbalancing effects of the spring.

When the machine is thus rotated to the right by the handles 32 the spring 75 will expand and the arm 76 will swivel on its pivot 77 when the angle of the machine is changed with respect to the horizontal. In other words, the oscillation of the arm 76 about its pivot makes possible the manipulation of the machine to a variety of different angular positions in its vertical plane without losing the counterbalancing effects of the spring 75 which tends to return the machine to the normal horizontal position shown in Figure 2.

Frequently, it is desired to secure the machine in a rigid horizontal position and convert the same into a grinder. To accomplish this, a floor stand is provided (Fig. 6) consisting of a base 81 with provisions at 82 for securing the same to a floor. An upright 82a is mounted on the base and carries a saddle 83 on its upper end in which is placed the collar 38 of the machine, said collar being situated at the approximate

center of gravity of the machine. A set screw **84** on the saddle **83** bears against the collar **38** to hold the machine securely in place in the saddle.

In Figure 5 is shown a grind wheel adapter consisting of a pulley **85** grooved to accommodate a V-belt **86** which latter is driven by a V-pulley **86***a* (Fig. 7) mounted on the shaft of motor **13**. The pulley has an elongated and threaded hub **87** on which is mounted a grinding wheel **88**. A retaining flange **89** is threaded onto the hub **87** against the grinding wheel **88**, followed by a lock nut **90**. An opening **91** is provided in the retaining flange **89** to receive a tool for loosening and tightening the flange.

In operating the machine as a belt sander the sanding belt **25** is applied by loosening the set screw **16***a* which locks the tubular body sections **10** and **15** against relative displacement. The section **15** is then thrust inwardly against the resistance of the spring **16** within section **10**. The belt **25** is then mounted on pulleys **24** and **27** whereupon the body section **15** is released and is extended by pressure of the spring **16** and thus imposes tension on the belt **25**.

The machine may be operated as a sander when swinging from the vertical suspension or when secured on the floor stand shown in Figure 6.

When the machine is to be converted to a grinder, the pulley **24** is replaced by the adapter shown in Figure 5 and a conventional V-belt pulley is substituted for the pulley **27** on the motor shaft and a V-belt **86** is mounted on the pulleys. It is necessary also to secure the machine in the described manner on the floor stand when using the same as a grinder.

It will be observed in Figures 1, 2 and 3 that a switch **91** is mounted on the bifurcated casting **37** for controlling current to the motor **13** through conduit **92**.

Manifestly, the construction as shown and described is capable of some modification and such modification as may be construed to fall within the scope and meaning of the appended claim is also considered to be within the spirit and intent of the invention.

What is claimed is:

In a sanding machine having body members composed of telescopically related elements, a

driving motor supported by one of said members at one end of said machine, a suspension means for said machine comprising a collar embracing another of said body elements, a lateral extension on said collar, a sleeve rotatable on said lateral extension, a casting integral with said sleeve, a suspension column composed of a pair of tubular telescopically related sections, the lower of which is attached to said casting at its lower end, a ceiling mounting plate having a stub shaft thereon, a suspension arm mounted for radial displacement on said shaft, a yoke movable longitudinally on said suspension arm and having swivel connection with the upper end of said suspension column, a coil spring within said column supporting the weight of said sanding machine within the limits of relative displacement of the tubular sections of said suspension column, means for releasing and securing said collar and sleeve for angular adjustment of said sanding machine, an arm pivoted at one end on the under side of said motor, a spring hanger above said motor, a coil spring connected between said hanger and pivoted arm to resist forces tending to displace said machine from its normal horizontal position, the arm being adapted to oscillate about a vertical axis, and means for securing the sections to said suspension column in vertically adjusted positions.

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