

Aug. 16, 1932.

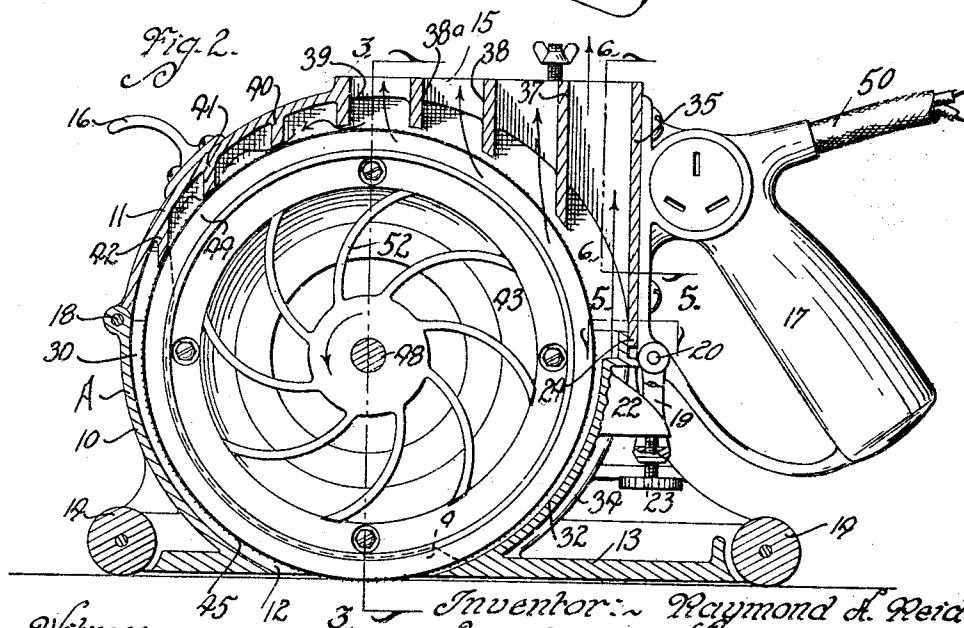
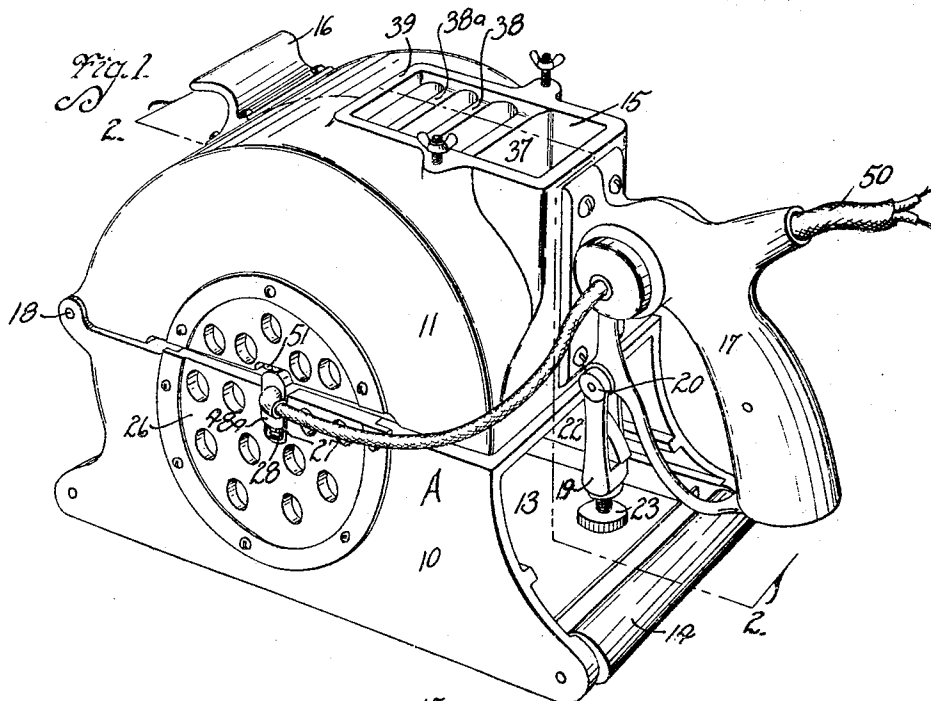
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SANDING MACHINE

Filed May 21, 1930

2 Sheets-Sheet 1



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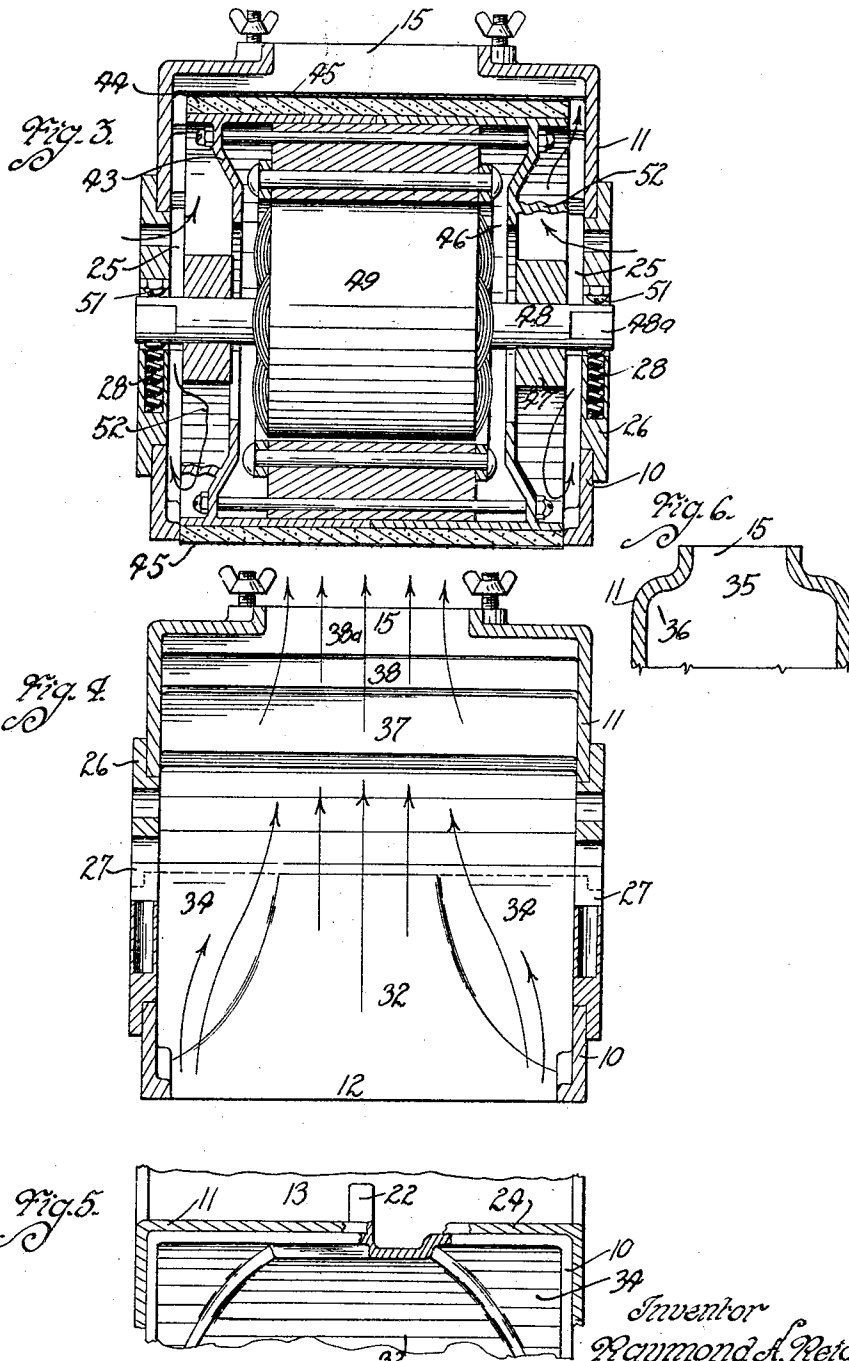
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SANDING MACHINE

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The object of my invention is to provide a sanding machine of simple construction having a number of novel features, whereby an efficient, economical apparatus is afforded.

For instance, it is my purpose to provide such a sanding machine of the type in which a motor driven sanding drum is mounted within a casing and the casing is of such novel construction as to properly control the air currents through the machine.

In this connection, it is my purpose to provide a drum having fan blades on the ends thereof, and to make the interior of the drum in such shape as to properly conduct and discharge the air in such a manner as to cool the motor and to allow a minimum carry over of air and dirt and sand.

Another purpose is to provide such a sanding machine having a novel construction for mounting the sanding drum.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my sanding machine, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 shows a perspective view of a sanding machine embodying my invention.

Figure 2 is a vertical, sectional view through the machine taken on the line 2—2 of Figure 1.

Figure 3 is a transverse, sectional view of the machine taken on the line 2—2 of Figure 2.

Figure 4 is a similar view of the casing alone.

Figure 5 is a detail, sectional view taken on the line 5—5 of Figure 2, parts being broken away and parts being shown in section; and

Figure 6 shows a detail, sectional view taken on the line 6—6 of Figure 2.

Casing

I shall first describe the casing of my sanding machine. The casing is generally speaking cylindrical in form and is indicated generally by the reference character A.

The casing comprises a lower half or member 10 and an upper half or member 11. The lower half is provided with an opening in its bottom, as indicated at 12, through which a portion of the sanding drum projects.

The lower half is also provided with a base 13 projecting forwardly and rearwardly from the casing.

For convenience in describing the machine, I will refer to that end which is adjacent to the operator as the front of the machine.

At the front and rear of the base 13 are small transverse rollers 14 adapted to travel on a floor or an article being sanded in such a way as to support the machine slightly above the surface on which it travels as shown in Figure 2.

The upper casing member 11 has in its forward portion and its top an opening 15, preferably rectangular in section for the attachment of a dust collecting bag or other dust conductor or receptacle. This upper casing member 11 has near its rear part a suitable handle 16 and at its front part an operating handle 17.

One of the purposes of my invention is to provide means whereby the upper casing member 11 may be locked on the lower casing member 10 so as to allow some up and down adjustment of the upper casing member.

This is done because the sanding drum is mounted on springs as hereinafter more fully explained, and by providing for the up and down adjustment of the upper casing member 11, its upper limit of adjustment can be regulated, and it will thus serve to limit the maximum height at which the sanding drum may rest upon its spring supports to allow the sanding drum to be depressed manually at will by the operator.

For thus connecting the upper and lower casing members, they are hinged together as at 18 at the back of the machine.

At the front of the machine, the arms of a yoke 19 are pivoted as at 20 to the lower forward edge of the upper casing member.

The lower casing member is provided at the front with a lug 22, which may be received between the arms of the yoke 19, as

shown in Figure 2. In the closed end of the yoke 19 is mounted an adjusting screw 23 for providing the desired adjustment.

It should be mentioned that the front part 5 of the lower casing member is rabbeted as at 24 to afford a better joint. At the sides of the casing are openings 25, which may be covered by split perforated cover plates 26. The upper edges of the lower cover plate 10 members 26 are provided with opposite slots 27 and in the lower parts of these slots are seated springs 28 (see Figures 1 and 3) upon which the motor shaft ends hereinafter mentioned may be supported.

The casing is provided at each side with a rib 30 shown partly in full lines and partly in dotted lines in Figure 2, extending adjacent to the inner surface of the periphery of the casing from above the joint line, as shown, 20 downwardly and thence forwardly beyond the opening 12. This rib is to afford a more nearly airtight joint as will be hereinafter again referred to.

The front portion of the lower casing member 10 is provided on its interior with a thickened portion 32 (see Figure 4) extending from the opening 12 upwardly to the upper edge of said member. This thickened portion 32 is curved from its lower part a 30 little beyond the opening 12 upwardly and inwardly to the upper end of the thickened portion 32, as shown in Figure 4, to thus leave at its sides air release spaces 34, the purpose of which will be later more fully referred to.

The front wall of the upper casing member 11 is extended at its central portion substantially midway between its sides straight upwardly to the opening 15 as indicated at 35 in Figure 2.

40 On the inside, the sides of the upper casing member 11 near the front portion thereof are curved inwardly and upwardly as indicated at 36 in Figure 6 for better directing the air through the outlet 15.

45 Spaced rearwardly from the front wall portion 35 (see Figure 2) is a transverse partition member 37, extending downwardly from the opening 15 to a line close to the path of travel of the periphery of the sanding 50 drum.

Spaced rearwardly from the front wall portion 35 (see Figure 2) is a transverse partition member 37 extending downwardly from the opening 15 to a line close to the path of travel of the periphery of the sanding 55 drum.

Spaced rearwardly from the partition 37 is a shorter partition 38 similarly extending downwardly from the opening 35 to position 60 close to the path of travel of the sanding drum.

Spaced rearwardly from the partition 38 is a similar somewhat shorter partition 38a. Similarly spaced rearwardly from the partition 38a is another partition 39 and spaced 65

therefrom rearwardly a partition 40 and spaced rearwardly therefrom a partition 41a and rearwardly therefrom is a partition 42.

All of these partitions project downwardly to lines close to the path of travel of the drum. 70

The partition 39 extends downwardly from the rear edge of the opening 15 as shown.

The purpose of these partitions will be again referred to.

Sanding drum

I provide a hollow sanding drum 43, which is provided on its periphery with a felt covering 44 (see Figure 3) on the outside of which is tightly stretched sand paper 45. 80

The drum 43 also serves as the rotor of an electric motor.

The side walls of the drum 43 are provided with perforations 46 (see for instance Figure 3) for the passage of air. 85

At the centers of the sides of the drum are heavy journals 47 in which rotate the shaft 48 of the motor stator 49. The ends of the shaft 48 are flattened as at 48a, so that when they are inserted in the slots 28 hereinbefore 90 described the shaft and the stator cannot rotate, but the rotor can rotate on the shaft.

The current conducting cable 50 may extend to and through the handle 17 and thence through one end of the shaft 48 to the motor. 95 The electric connections are of the ordinary construction and need no further present description. The handle 17 may be provided with a switch if desired.

It will be noted that the periphery of the sanding drum extends close to the side walls of the casing, but that the side walls of the sanding drum are arranged inwardly from the casing. The sanding drum is provided with fan blades 52, as more particularly 100 shown in Figure 2.

I shall now describe the practical operation.

Practical operation

Before beginning the operation of the machine, the sanding drum is adjusted as to height, so as to regulate its abrasive action according to the particular job upon which the machine is at the time operated. 110

The shaft ends rest upon the springs 28, which, of course, tend to raise the drum to its maximum adjusted height. The lower edges of the sides of the upper casing member 11 are provided with adjusting screws 51 which 115 may be regulated to level the sanding drum with relation to the bottom of the frame.

Another and important regulation is provided by means of the adjusting screw 23 (see Figures 1 and 2). By adjusting the 125 screw 23, the height to which the upper casing member 11 may be pushed is determined, and the height of the casing member 11 thus regulates the maximum height of the drum. Thus, by means of the screw 23, the spring 130

mounting of the sanding drum and the arrangement of the parts, the operator can regulate the cut of the sanding drum instantaneously and without lifting the upper casing member 11.

When the machine is started, the sanding drum rotates anti-clockwise, if viewed as shown in Figure 2. The fan blades create a current of air and thus draw air through the motor for cooling it and drive air outwardly at their ends.

The rotation of the motor also tends to create a current of air for driving the sand and dirt out through the opening 15 into the dust collecting bag, not shown.

There is, of course, a tendency for the fan blades and for the motor to drive air radially outwardly around the edges of the sanding drum. There is also a tendency to carry air past the opening 15 and around the drum. These tendencies are controlled and such movements of air practically eliminated by the construction of my machine. The ribs 30 above described fit quite snugly with relation to the felt covering member 40 of the sanding drum, and thus prevent the passage of air around the edge of the drum from the rib 42, shown in Figure 2, to the lower ends of the ribs, one of which is indicated at "a" in Figure 2.

The thickened portion 32 and the air release spaces 34 serve important functions in controlling the action of the sander dust as it leaves the work. The sander dust is carried upwardly with the currents of air above mentioned along the surface of the sanding drum, until the dust and air reach the air release portions or spaces 34, where the dust joins or is joined by the air column released around the ends of the drum and created in part by the drum and in part by the fan.

The air and dust tend to pass out through the opening 15 and the shape of the portions 32 and 34 (Figure 4) and of the interior of the front upper portion of the upper casing member 11 cause the dust to be formed into a narrow stream, leaving the air at the outer sides of the housing substantially clean and free from dust. This is an important feature of the present device.

It is important that the sanding drum should run in fairly close contact with the portion 42. If the sander were not so designed, I find that there is some trouble due to the fact that the air pressure built up by the fan blades on the end of the drum might rise to a point where it would over-balance the centrifugal air current, which is carrying the dust up to the air release portions 34 and form a return eddy and discharge some of the dust through the opening 12.

I shall now refer to the function of the partitions or baffles or ribs 37 to 42 inclusive.

If the housing were smooth in its upper interior, there would be a strong suction

created by the revolving drum in the housing due to centrifugal force and the air currents, which would have a tendency to pull the dust over past the exit opening around the drum and cause it to be discharged through the opening in the bottom of the housing through which the drum acts on the work. The dust would then be blown into the air. To prevent this, I have provided the series of partitions or ribs mentioned, which extend quite close to the surface of the sanding drum. The partitions 37, 38, 38a and 39 are engaged by the air and dust and cause the air and dust to be directed vertically upwardly and outwardly through the opening 15. They also serve to break the current of air, which would otherwise pass around the drum.

The partitions 38a, 39, 40, 41 and 42 also serve to slow down and stop the movement of the air around the drum by causing it to be alternately compressed and released as it were. That is the air is compressed as it strikes the front sides of these partitions and what air escapes under them is then released, so that the tendency of the air to continue to pass around the drum is almost entirely eliminated and any pressure becomes less and less.

I have shown in my drawings and explained in my description details of structure whereby a practical embodiment of my invention may be had, but it is not my purpose to limit myself to the exact structure shown, and I desire to cover by my claims any modifications in structure or use of mechanical equivalents, which may be reasonably included within their scope.

I claim as my invention:

1. In a sanding machine, a casing comprising lower and upper members, means for hinging said members together at one end, means for locking said members together at the other end, capable of adjustment for allowing variation in the adjustment of the members with each other, said casing having an opening in its bottom, and shaft receiving vertical slots in the lower member, a sanding drum in the casing, forming also a motor rotor, a stator in the drum having fixed shaft ends non-rotatably received in said slots, for vertical sliding adjustment, springs for supporting the shaft ends in said slots, whereby the sander drum is spring supported and its highest position may be limited by adjustment of said second means.

2. In a sanding machine, a casing comprising lower and upper members, said casing having an opening in its bottom and vertical shaft receiving slots at its sides in the lower member, a sanding drum in the casing having stub shafts received in said slots, for vertical adjustment, springs for supporting the stub shafts in said slots, securing means for fastening said members together,

said last-named means being adjustable so that the drum may be yieldingly supported on said springs and its maximum height may be regulated by the upper casing member and the adjustment of said securing means.

3. In a sanding machine, a substantially cylindrical casing having an opening in its bottom and having an opening in its top adjacent to one end for the egress of dust, a sanding drum rotatably mounted in said casing, said casing having on its interior in its end below said second opening a portion fitting closely to the surface of the drum and extending from said first opening upwardly and with air release spaces at the sides of said portion wider at their upper than at their lower ends.

4. In a sanding machine, a substantially cylindrical casing having an opening in its bottom and having an opening in its top adjacent to one end for the egress of dust, a sanding drum rotatably mounted in said casing, said casing having on its interior in its end below said second opening a portion fitting closely to the surface of the drum and extending from said first opening upwardly and with air release spaces at the sides of said portion wider at their upper than at their lower ends, said sanding drum having a fan at one end.

5. In a sanding machine, a substantially cylindrical casing having an opening in its bottom and having an opening in its top adjacent to one end for the egress of dust, a sanding drum rotatably mounted in said casing, said casing having on its interior in its end below said second opening a portion fitting closely to the surface of the drum and extending from said first opening upwardly and with air release spaces at the sides of said portion wider at their upper than at their lower ends, said casing having at its interior at its other end inwardly extending ribs for preventing the escape of air around the periphery of the drum, said ribs extending from said first opening substantially a quarter way around the casing.

6. In a sanding machine, a substantially cylindrical casing having an opening in its bottom and having an opening in its top adjacent to one end for the egress of dust, a sanding drum rotatably mounted in said casing, said casing having on its interior in its end below said second opening a portion fitting closely to the surface of the drum and extending from said first opening upwardly and with air release spaces at the sides of said portion wider at their upper than at their lower ends, said casing having at its interior at its other end inwardly extending ribs for preventing the escape of air around the periphery of the drum, said ribs extending from said first opening substantially a quarter way around the casing, said sanding drum having a fan formed thereon.

7. In a sanding machine, a substantially cylindrical casing having an opening in its bottom and having an opening in its top adjacent to one end for the egress of dust, a sanding drum rotatably mounted in said casing, said casing having on its interior in its end below said second opening a portion fitting closely to the surface of the drum and extending from said first opening upwardly and with air release spaces at the sides of said portion wider at their upper than at their lower ends, said casing having a series of transverse partitions extending across said opening and extending inwardly substantially to said sanding drum.

8. In a sanding machine, a substantially cylindrical casing having an opening in its bottom and having an opening in its top adjacent to one end for the egress of dust, a sanding drum rotatably mounted in said casing, said casing having on its interior in its end below said second opening a portion fitting closely to the surface of the drum and extending from said first opening upwardly and with air release spaces at the sides of said portion wider at their upper than at their lower ends, said casing having a series of transverse partitions extending across said opening and extending inwardly substantially to said sanding drum, and additional spaced transverse partitions beyond said opening in the travel of the drum extending inwardly from the wall of the casing substantially to the drum.

9. In a sanding machine, a substantially cylindrical casing having an opening in its bottom and having an opening in its top adjacent to one end for the egress of dust, a sanding drum rotatably mounted in said casing, said casing having on its interior in its end below said second opening a portion fitting closely to the surface of the drum and extending from said first opening upwardly and with air release spaces at the sides of said portion wider at their upper than at their lower ends, said casing having at its interior at its other end inwardly extending ribs for preventing the escape of air around the periphery of the drum, said ribs extending from said first opening substantially a quarter way around the casing, said casing having a plurality of transverse partitions in its upper portion extending inwardly from the top of the casing substantially to the sanding drum.

10. In a sanding machine, a substantially cylindrical casing having an opening in its bottom and having an opening in its top adjacent to one end for the egress of dust, a sanding drum rotatably mounted in said casing, said casing having on its interior in its end below said second opening a portion fitting closely to the surface of the drum and extending from said first opening upwardly and with air release spaces at the sides of said portion wider at their upper than at their

lower ends, said casing having at its interior at its other end inwardly extending ribs for preventing the escape of air around the periphery of the drum, said ribs extending from
5 said first opening substantially a quarter way around the casing, said casing having a plurality of transverse partitions in its upper portion extending inwardly from the top of the casing substantially to the sanding drum,
10 and means for yieldingly mounting the drum, said casing being made in upper and lower parts, the upper part serving to limit the upward movement of the drum, and means for locking the upper to the lower casing part in
15 different positions against further upward movement.

11. In a sanding machine, a substantially cylindrical casing having an opening in its bottom and having an opening in its top adjacent to one end for the egress of dust, a sanding drum rotatably mounted in said casing, said casing having on its interior in its end below said second opening a portion fitting closely to the surface of the drum and extending from said first opening upwardly
25 and with air release spaces at the sides of said portion wider at their upper than at their lower ends, said casing having a series of transverse partitions extending across said opening and extending inwardly substantially to said sanding drum, and additional spaced transverse partitions beyond said opening in the travel of the drum extending
30 inwardly from the wall of the casing substantially to the drum, said drum having fans on its ends.

Des Moines, Iowa, April 4, 1930.

RAYMOND A. REID.

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