May 4, 1926. 1,583,145

C. E. HAYNES

FLOOR SURFACING MACHINE

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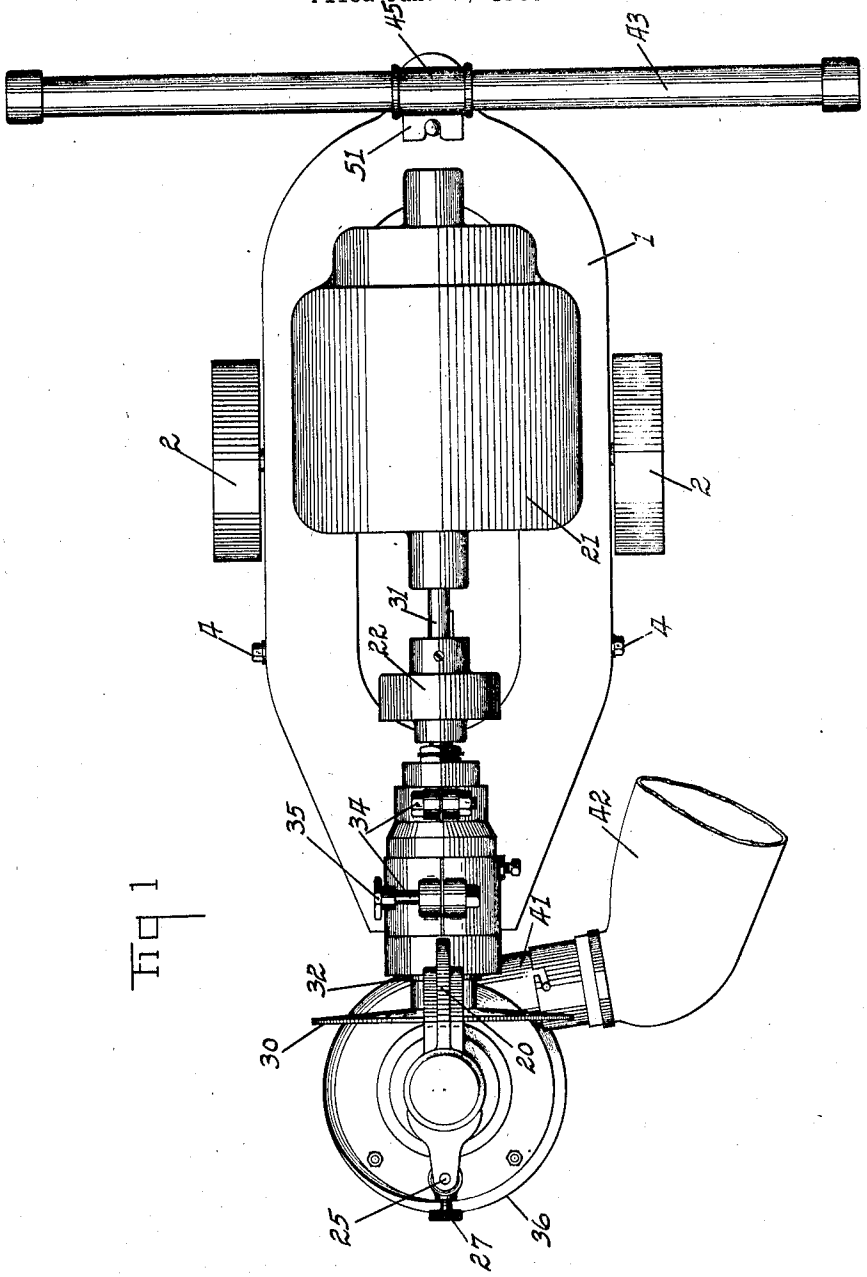


Fig 1

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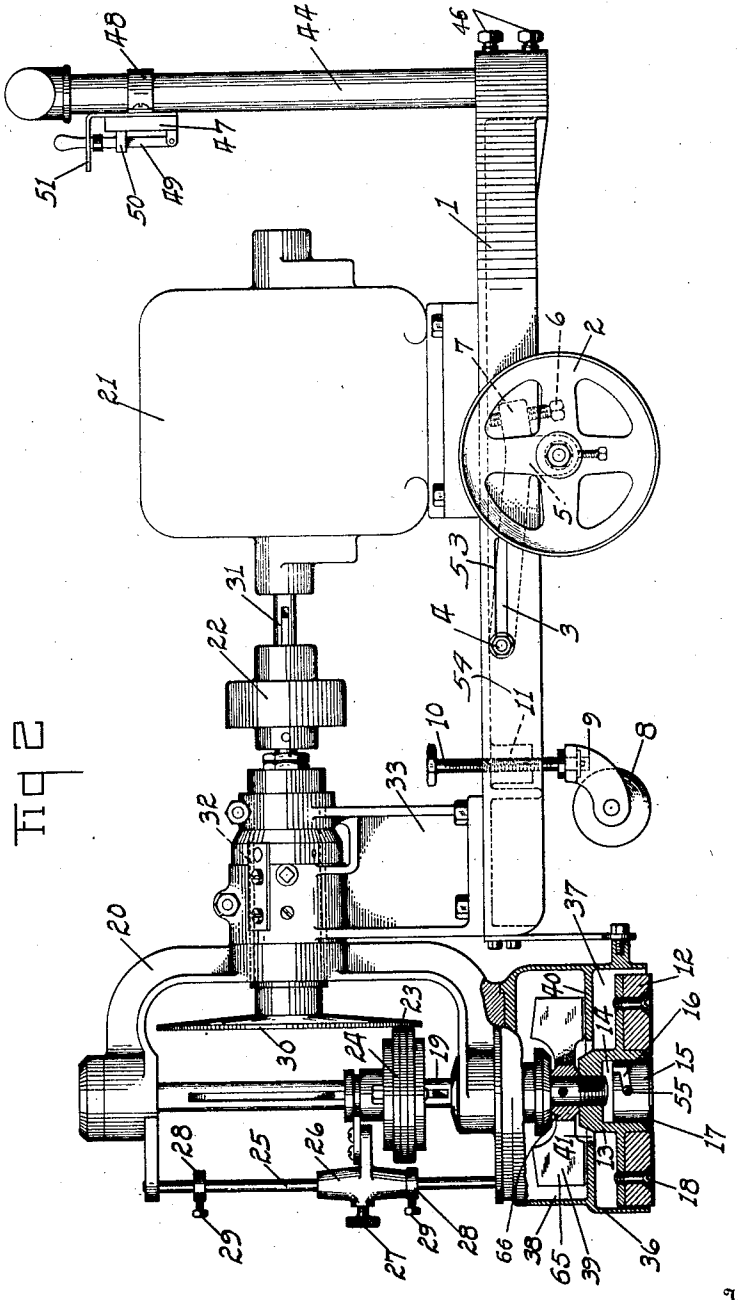


Fig 2

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UNITED STATES PATENT OFFICE.

CHARLES E. HAYNES, OF TOLEDO, OHIO.

FLOOR-SURFACING MACHINE.

Application filed January 7, 1924. Serial No. 684,712.

To all whom it may concern:

Be it known that I, CHARLES E. HAYNES, a citizen of the United States, and a resident of Toledo, in the county of Lucas and State of Ohio, have invented a new and useful Floor-Surfacing Machine, which invention is fully set forth in the following specification.

My invention has for its object to provide an exceedingly efficient and compact floor-surfacing machine that is so constructed that it may be easily manipulated to accurately finish floor surfaces in parts of the floor that are difficultly accessible, as well as in the central portions of the floor. Discs of abrasive or polishing paper or other bodies having the desired finishing surfaces, are connected to the machine and are rotated, while in contact with the floor, by the machine. The discs or bodies may be used in conjunction with loose materials such as detergent material, or with material to be worked into the floor, such as wax. The invention thus consists also in providing simple means whereby the discs may be easily removed and connected to the machine, and in providing an efficient means for removing the dust produced in the operation of the machine, and preventing it from escaping into the room. The invention also has for its object other advantages and features which will appear on examination of the drawings and from the following description.

The invention may be contained in structures which in their details vary. To illustrate a practical application of the invention, I have selected a floor-polishing machine as an example of structures containing my invention and shall describe it hereinafter. The structure selected is illustrated in the accompanying drawings.

Figure 1 of the drawings is a top view of the machine. Fig. 2 is a side view of the machine, a part thereof being shown in section.

The machine is supported on a carriage having a frame or body 1. A pair of wheels 2 having wide rims are supported, for rotation, in a subsidiary frame 3 that is pivotally connected to the body of the machine by means of the bolts 4. The wheels 2 are rotatably located in depending arms 5. The arms 5 are located quite remote from the bolts 4 and at the rear of the bolts. The frame 3 is adjusted in its position relative to the frame 1 by means of the bolt 6 that extends through a projection 7 of the frame and upwards against the under side of the body frame 1. Thus the frame 1 may be raised and lowered relative to the axis of the wheels 2 by rotation or adjustment of the bolt 6 in the frame 3. The normal angular position of the frame 1 relative to the floor may be adjusted by means of the caster wheel 8 that is located in front of the wheels 2. The caster wheel 8 is located in a forked member 9 that is pivotally connected on the end of the threaded rod 10 and so as to swivel on the end of the rod. The rod 10 extends through the frame 1 and, preferably, through a boss 11 formed on the under side of the frame. The height of the forward end of the frame may thus be adjusted by rotating the threaded rod 10 so as to vary the distance betewen the axis of the caster wheel 8 and the under side of the frame 1. The device for polishing or rubbing the floor is supported on the forward end of the frame 1 and so as to depend from the frame. Consequently, the threaded rod is adjusted so as to bring the surfacer against the floor when the machine is to be used to surface floors that have to be formed on a perfect level.

The surfacing device has a rotating member 12. The member 12 is provided with a recess or cupped portion 13 that forms a central recess 14. A rod 55 extends across the recess 14. The ends of the rod 55 are secured in the rotating member 12. A shell 15 fits the recess 14 and is provided with a pair of bayonet slots 16. The body portions of the slots 16 extend spirally around the axis of the shell 15 and then annularly upwards to the edge of the shell. The shell 15 may thus be inserted in the cupped portion 13 by moving the shell so that the pin 55 will enter the bayonet slots 16 and then rotating the shell 15. This will draw the shell 15 into the recess 14. The shell 15 is provided with a flange 17 that extends laterally from the side of the shell, and the lower surface of the rotating member 12 is recessed so as to receive the flange 17. A disc 18 of abrasive material such as sand paper, is secured to the rotating member 12 by means of the sleeve 15. The disc 18 has a central opening having a diameter substantially the same as that of the body portion of the shell 15 and so that when the shell 15 is locked in the recess 14, the flange 17 will engage the inner edge, that is, the edge about the opening in

the disc 18, and draw it into the recess formed at the edge of the cupped portion 13. The inner edge of the disc will thus be clamped between the flange 17 and the edge of the cupped portion 13, the recess at the edge of the cupped portion 13 being sufficient to permit the lower surface of the flange 17 of the shell 15 to be located slightly above the abrasive surface of the disc 18. To connect the disc 18 to the rotative member 12, all that is necessary is to insert the shell 15 through the disc 18 and place the shell 15 in engaging relation to the pin 55 and then turn the shell by turning the disc 18.

The rotative member 12 is connected to a shaft 19. It may be threaded on to the end of the shaft. The shaft 19 is supported in bearings formed in the ends of the arms of the yoke 20. The shaft 19 is driven by a suitable electric motor 21 which is connected to the shaft 19 through the universal connector 22 and the friction gear 23. The friction gear has an adjustable friction wheel 24 that is slip-keyed to the shaft 19. A rod 25 extends between the ends of the yoke 20 and is provided with an adjustable slide 26. The slide 26 may be secured in any position on the rod 25, as by the handscrew 27. If desired, the slide 26 may be secured in any adjusted position by means of the collars 28 that are provided with the key-bolts 29 for locking them in any position along the rod. Also, the collars 28 may be used to limit the range of proper adjustment of the slide 26. The disc 30 operates upon the disc wheel 24 to cause rotation of the disc wheel 24 at a speed that varies according to its position relative to the axis of the shaft 31 and the disc 30. The yoke 20 is connected to a sleeve 32 that extends through a pedestal 33. The top of the pedestal may be split, that is, cut, and the sleeve 32 may be tightly clamped by means of the bolts 34 which will securely lock the sleeve and the yoke 20 in any position that they may be turned. Thus, the angular relation of the lower surface of the rotating member 12, and particularly the abrasive surface of the disc, may be located at any desired angle to enable the machine to surface close to the edges of the floor, that is, close to the side walls. One of the bolts 34 may be operated by a handle 35 whereby one of the slotted parts of the pedestal 33 may be easily opened and the yoke 20 turned to the desired position. Whereupon, the sleeve and the yoke 20 may be secured in their adjusted position by rotating the handle 35.

In order to properly balance the load on the frame and yet to secure the desired pressure of the rotating member on the floor, the location of the axis of the wheels 2 is adjusted by means of the bolts 4 that connect the subsidiary frame 3 to the frame 1. The bolts extend through slots 53 formed in depending flanges 54, forming parts of the frame 1. The bolts may be secured at any point along the frame. Thus, electric motors of different weights may be located on the frame and the load on the frame properly balanced for ease of operation.

In the operation of the machine, it is very desirable to remove the dust from the floor as fast as it is formed, as well as it being desirable to prevent the dust from passing into the surrounding air of the room. In order to collect the dust, a shell 36 is located near the lower outer edge of the rotative member 12 and so as to be in close proximity to the surface of the floor. It is connected to one of the arms of the yoke 20. The shell 36 has a chamber 37 slightly larger than the rotative member 12, and in which the rotative member 12 is located. This leaves a small space around the edge of the rotative member 12 and a space above the member 12 through which air may be drawn by a fan. This will collect the dust from around the edge of the rotative member 12 as fast as it is ejected from beneath the rotative member 12 by its rotation. The shell 36 is also provided with a chamber 38 in which a fan 39 is located. The two chambers 37 and 38 are separated by a partition 40 which is provided with a central opening 41 that surrounds the cupped portion 13 of the rotative member 12. The fan 39 is pinned to the shaft 19 in contact with or in close proximity to the cupped portion 13 of the rotative member 12. The vanes 65 of the fan 39 are connected to or formed integrally with the arms 66 that extend across the edge of the central opening 41 in the partition 40 and thus efficiently draws the air from the lower chamber when the vanes are rotated, together with any dust that may be produced at the edge of the shell 36. By this arrangement the air pressure is greatly reduced within the lower chamber of the shell particularly when the lower chamber is substantially closed. The vanes thus extend radially from the annular opening 41 formed between the cupped portion 13 and the edge of the wheel 40. By the centrifugal action of the vanes 65, the air will be drawn between the lower edge of the shell 36 and the rotating member 12 and up through the annular opening into the chamber 38, from which it will be forced by the rotation of the vanes 65 through a suitable outlet such as through the pipe 42. It may be directed into a suitable cloth bag 42, that may be secured to the pipe 41. The dust will thus be gathered by the moving air and will be directed and collected in the bag 42, the air finding outlet through the fabric of which the bag 42 is composed.

It will thus be seen that I have provided a comparatively simple floor-surfacing ma-

chine, wherein the parts may be positioned close together so as to reduce the length of the supporting frame 1 of the machine, and also whereby the parts may be readily adjusted. To manipulate the machine, a handle or bar 43 may be connected to an upright bar 44. The bars 43 and 44 may be formed of pipe and are connected together by the usual T 45. The upright 44 may be adjustably secured to the frame 1 by the key-bolts 46. A switch for the motor 21 may be connected to the handle. An insulating block 47 may be secured by a strap 48 to the upright 44 and a movable switch member 49 may be pivotally supported on the insulating block 47, and so as to make contact with the stationary contact 50 when it is desired to close the circuit of the motor 21. The hands of the operator may be protected from contact with the terminals of the switch by means of a plate 51.

I claim:—

1. In a floor surfacing machine, a main frame having longitudinally slotted sides, a subsidiary frame having depending arms between the ends of the sides thereof, wheels journaled in said arms, bolts connected to the inner ends of the sides of the subsidiary frame and adjustably mounted in the slots of the main frame, a vertically disposed bolt carried by the outer end of the subsidiary frame and having its free end engaged with the under face of the body of the main frame, an abrasive member at the front end of the main frame, means to actuate the abrasive member, a caster wheel, and means to adjustably connect the caster wheel to the main frame at a point between the abrasive member and the wheels of the subsidiary frame.

2. In a floor surfacing machine, a frame, a vertically disposed yoke carried by the frame, a vertical shaft journaled in the yoke, an abrasive member connected to the shaft, a friction wheel slidably keyed on the shaft, a driven shaft carried by the yoke, a friction disk on the driven shaft engaged with the friction wheel, a vertical rod rigidly connected to the ends of the yoke, a slide on the rod engageable with the friction wheel to move the latter lengthwise of the rod, a thumb-screw carried by the slide to adjustably secure same to the rod, and a pair of adjustable collars on the rod disposed on opposite ends of the slide and being engageable therewith to hold the slide against movement axially of the rod.

3. In a floor surfacing machine, a frame, a vertically disposed yoke carried by the frame, a vertical shaft journaled in the yoke, an abrasive member connected to the shaft, a driven shaft carried by the yoke, a friction disk on the driven shaft engaged with the friction wheel, a vertical rod rigidly connected to the ends of the yoke, a slide on the rod engageable with the friction wheel to move the latter lengthwise of the rod, and means to fixedly secure the slide to the rod.

4. In a floor surfacing machine, a main frame, a subsidiary frame, means adjacent an end of the subsidiary frame to mount same on the main frame for pivotal and longitudinal movements relative to the main frame, wheels carried by the subsidiary frame, a vertical bolt carried by the opposite end of the subsidiary frame and having an end thereof engaged with the main frame, an abrasive member carried by the main frame and means to actuate the member.

5. In a floor surfacing machine, a main frame, a subsidiary frame, means adjacent an end of the subsidiary frame to mount same on the main frame for pivotal and longitudinal movements relative to the main frame, wheels carried by the opposite end of the subsidiary frame, means to hold the subsidiary frame in its adjusted position longitudinally of the main frame, means to effect vertical adjustment of the last named end of the subsidiary frame, an abrasive member carried by the main frame, and means to actuate the abrasive member.

6. In a floor surfacing machine, a frame, a substantially cylindrical-like shell carried by the frame and having its bottom open and arranged to lie close to the surface on which the machine is operating, a shaft journaled in the shell, an abrasive member on the shaft of less diameter than that of the open bottom of the shell so as to provide a circular air passage between the member and shell, a horizontal partition in the shell having a central opening through which the shaft extends in spaced relation to the wall defining the opening so as to provide a central air passage above the abrasive member, a fan on the shaft above the partition and operating over said last named air passage, and means connected to the shell above the partition to conduct air therefrom.

In testimony whereof, I have hereunto signed my name to this specification.

CHARLES E. HAYNES.