G. S. REYNOLDS.

FLOOR FINISHING AND SURFACING MACHINE.

APPLICATION FILED JUNE 6, 1911.

1,022,505.

Patented Apr. 9, 1912.

3 SHEETS—SHEET 1.

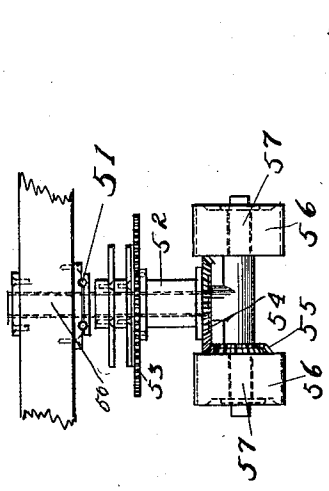

Fig. 5

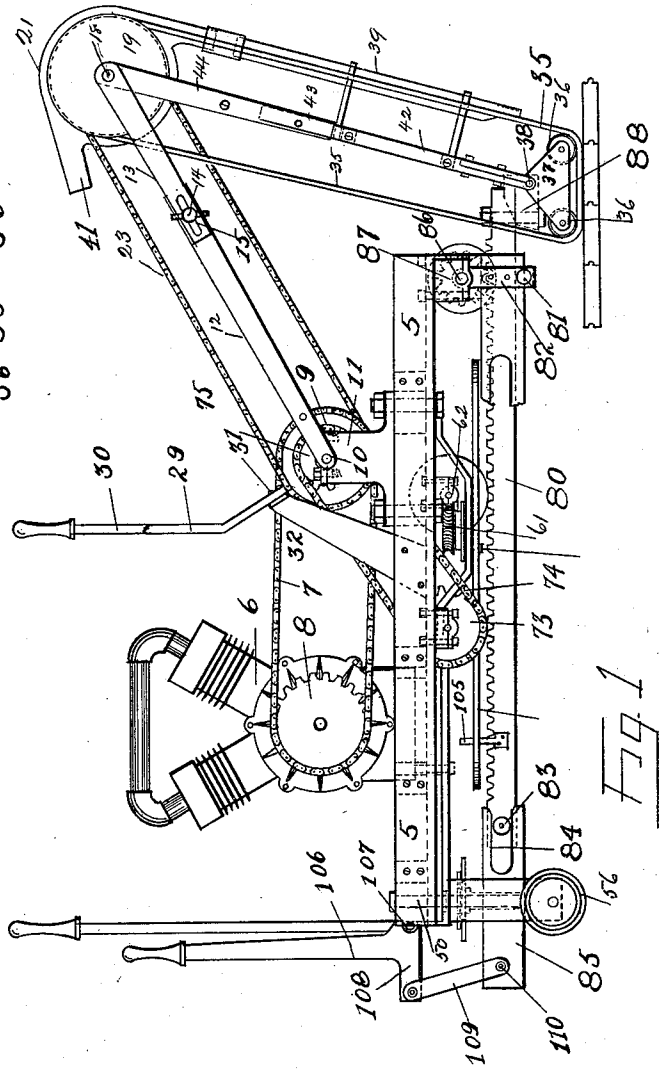

Fig. 1

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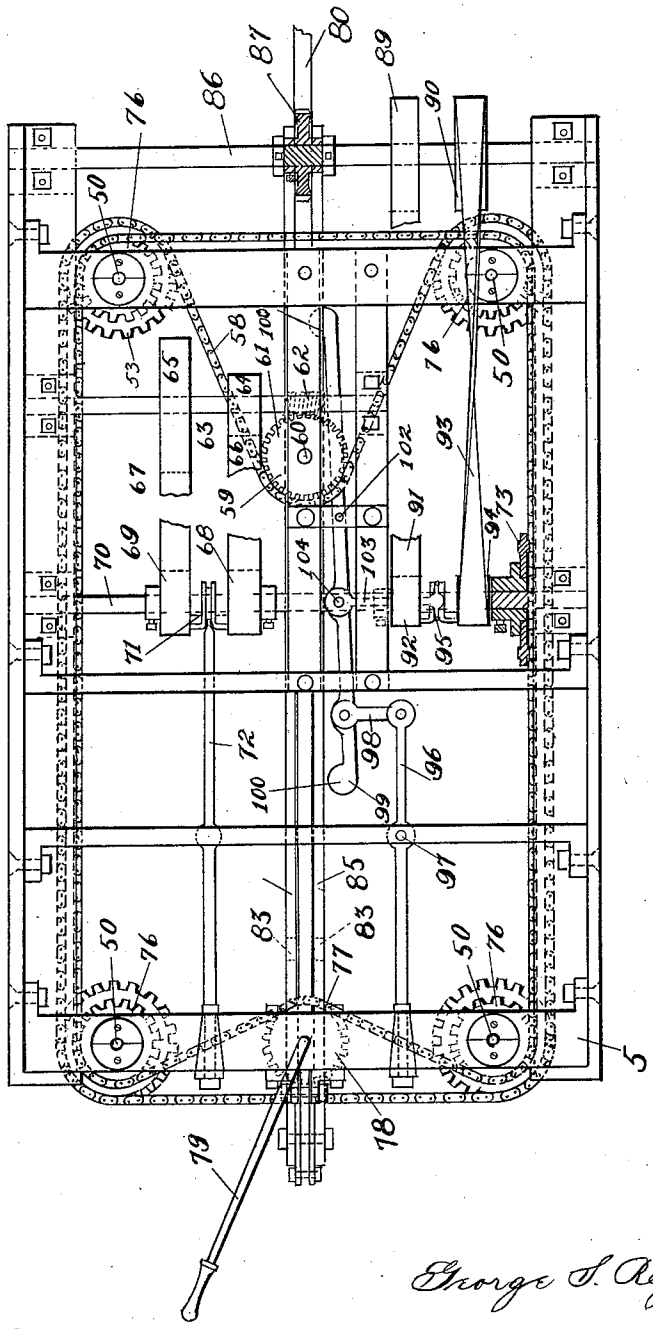
3 SHEETS—SHEET 2.

Fig 2



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3 SHEETS—SHEET 3.

Fig. 4

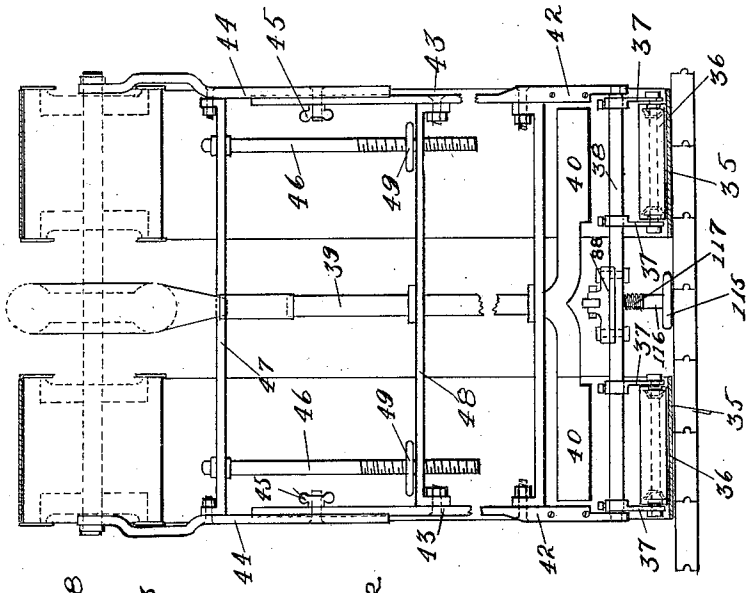
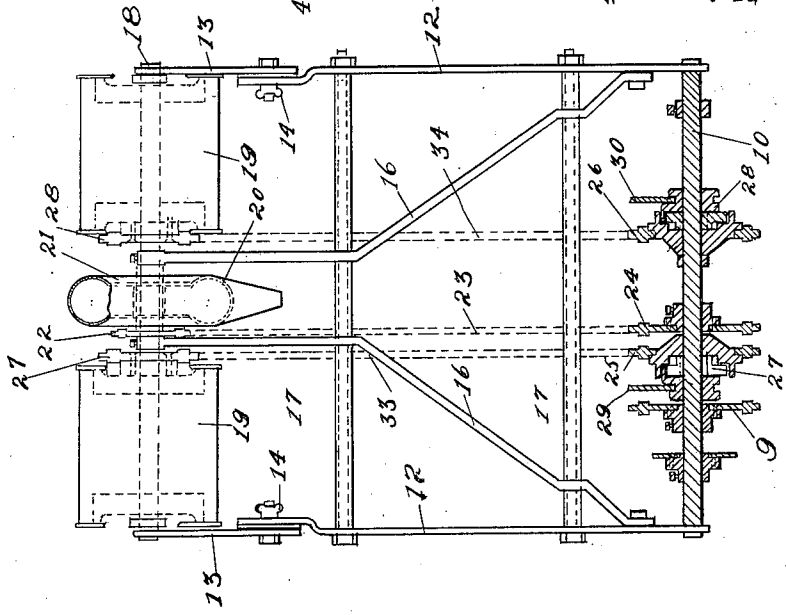


Fig. 3



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UNITED STATES PATENT OFFICE.

GEORGE S. REYNOLDS, OF SAN DIEGO, CALIFORNIA.

FLOOR FINISHING AND SURFACING MACHINE.

1,022,505. Specification of Letters Patent. Patented Apr. 9, 1912.

Application filed June 6, 1911. Serial No. 631,649.

To all whom it may concern:

Be it known that I, GEORGE S. REYNOLDS, a citizen of the United States of America, residing at San Diego, in the county of San Diego and State of California, have invented certain new and useful Improvements in Floor Finishing and Surfacing Machines, of which the following is a specification.

This invention relates to a floor finishing and surfacing machine, the object of the invention being to provide an improved device of this nature that will be self-propelling, will embody means for imparting travel to the abrasive belts, will embody means for imparting a bodily back and forth movement to said belts and will embody means for moving said abrasive belts out of contact with the floor.

A further object of the invention is the provision of a vacuum or suction mechanism for drawing dust and fibrous particles into a pipe.

A further object of the invention is the provision of improved controlling means for the mechanisms, hereinafter described.

Further objects and advantages of the invention will be set forth in the detailed description which now follows:

In the accompanying drawing, Figure 1 designates a side elevation of a floor surfacing machine constructed in accordance with the invention, some of the parts being omitted to preserve the clearness of the drawing, Fig. 2 is a plan view of the frame of the machine with certain of the portions above the plane of said frame omitted, Fig. 3 is a detail view showing one part of the swinging frame by which the abrasive belts are carried, Fig. 4 is a detailed view of the other portion of said swinging frame by which said belts are carried, Fig. 5 is a detail side view of one of the caster supporting spindles and the casters carried thereby. Like numerals designate corresponding parts in all of the figures of the drawing.

Referring to the drawing, the numeral 5 designates a horizontal supporting frame. The motive power is derived from a gasolene or other motor 6. This motor drives through a chain 7 and sprockets 8 and 9 to a shaft 10, said shaft being mounted in bearings 11 of the frame.

The mechanism for supporting and driving the abrasive belts is as follows: A two-part frame, illustrated in Figs. 1 and 3 and comprising the inner members 12 and the outer members 13, is swingingly mounted upon the shaft 10. The members 13 are adjustable with relation to the members 12 by means of set screws 14 which pass through slots 15 in members 12 and through the inner ends of the members 13. Braces 16 and spacing members 17 impart the desired rigidity to the structure as a whole. A shaft 18 is mounted in the outer ends of the members 13 and this shaft carries drums 19. This shaft 18 likewise carries a fan 20 that is located in a casing 21. This fan is driven by a sprocket 22, said sprocket in turn being driven by an indicated chain 23 from a sprocket 24 on shaft 10. Sprockets 25 and 26 are adapted to be brought into clutched relation to shaft 10 through the medium of indicated clutches 27 and 28. These clutches are actuated by levers 29 and 30, which levers are pivotally mounted at 31 upon a suitable support 32. The sprockets 25 and 26 drive sprockets 27 and 28 on shaft 18 through the medium of the indicated sprocket chains 33 and 34. Abrasive belts 35 pass over the drums 19 and over rollers 36 that are mounted in hangers 37 depending from a shaft 38. A suction pipe 39 has nozzles 40 adjacent the lower portions of the abrasive belts, the purpose of this structure being to draw up into the fan casing 21, the particles released by the action of the abrasive belts. A discharge pipe 41 leads from the fan casing and through this discharge pipe the dust and dirt may be delivered into any suitable receptacle. The shaft 38 is mounted in the lower portions 42 of a frame 43. This frame comprises outer portions 44 adjustably connected by means of set screws 45 with the portions 42. Adjusting screws 46 pass through a transverse member 47 that is carried by the members 44 and are rigidly connected to said transverse member. The threaded ends of the screws 46 pass loosely through a transverse member 48 that is carried by the lower portions 42. Adjusting wheels 49 are threaded on these screws and bear against the transverse member 48. This structure provides means for adjusting the tension of the abrasive belts as will be readily understood.

The means for propelling the structure are as follows: Mounted near each corner of the frame and vertically journaled therein is a caster spindle 50. These caster spin-

dles have a ball bearing mounting with relation to the frame as indicated at 51 in Fig. 5. A sleeve 52 is loosely mounted upon each of these spindles, said sleeve carrying a sprocket wheel 53. These sleeves carry at their lower ends bevel gear wheels 54 which mesh with bevel gear wheels 55, there being one of these latter gear wheels secured to one of each pair of caster wheels 56. The caster wheels 56 are journaled upon axles 57 which project transversely from the lower ends of the spindles 50. It will be apparent therefore, that if rotation be imparted to the sprockets 53, this rotation will through the sleeves 52 by which the sprockets are carried and gear wheels 54 and 55, impart rotation to one caster wheel of each pair of caster wheels to thereby impart bodily movement to the machine as a whole. Such rotation is imparted to these sprocket wheels 53 by means of a sprocket chain 58. This sprocket chain passes around all of these sprocket wheels and around an additional sprocket wheel 59 that is fast upon a vertical shaft 60. This shaft carries a worm wheel 61 that meshes with a worm 62 on a shaft 63. Pulleys 64 and 65 are connected by belts 66 and 67 with pulleys 68 and 69 on a shaft 70. Either the pulleys 68 or 69 may be brought into clutched relation with the shaft 70 through the medium of a clutch 71 which may be thrown in either direction by a manually operable lever 72. When thrown in one direction, it causes the pulley 68 to move with the shaft 70 and to drive the pulley 64 of the same size on shaft 63, whereby the shaft 63 will be caused to move at the same rate of speed as the shaft 70. When the lever is thrown in the opposite direction, it causes the pulley 69 to drive the pulley 65, of larger size, on shaft 63, whereby the shaft 63 is caused to rotate at a slower rate of speed than shaft 70. The structure just described is, therefore, merely a change speed gearing between shafts 70 and 63, to permit the driving of the machine as a whole, at varying rates of speed. Motion is imparted to shaft 70 through a sprocket wheel 73, see Figs. 1 and 2. This sprocket wheel is driven by a sprocket chain 74 from a sprocket wheel 75 on shaft 10.

The means for steering the machine are as follows: Upon each of the spindles 50 is fixed a sprocket wheel 76. A sprocket chain 77 passes over all of the sprocket wheels 76 and over a sprocket wheel 78 to which a manually operable handle 79 is secured. It is apparent that when the handle 79 is moved, the sprocket chain 77 will be moved to thereby partially turn all of the sprocket wheels 76 and the spindles 50. By virtue of this structure, the machine may be caused to travel longitudinally, transversely or diagonally as will be readily understood.

The means for imparting a back and forth movement to the abrasive belts, in addition to the travel imparted thereto by the drums, comprise a longitudinally extending rack bar 80. The forward portion of this rack bar passes over a roller 81 mounted in a hanger 82. The rear portion of the rack bar is supported by rollers 83, these rollers traveling in channels 84 that are formed in the sides of guide bars 85. A shaft 86 carries a gear wheel 87 and meshes with the rack bar 80. The forward portion of this rack bar is connected at 88 with shaft 38. In addition to the gear wheel 87, the shaft 86 carries pulleys 89 and 90. A straight belt 91 passes over pulley 89 and over a pulley 92 on shaft 70. A cross belt 93 passes over pulley 90 and over a pulley 94 on shaft 70. A clutch 95 serves to clutch either the pulley 92 or the pulley 94 into engagement with shaft 70 and it is apparent that by the employment of the straight and cross belts, when one of these pulleys is clutched into engagement with shaft 70, shaft 86 is caused to turn in one direction and that when the other of said pulleys is clutched into engagement with shaft 70, shaft 86 is caused to turn in the opposite direction. Since the gear wheel 87 on shaft 86 engages the rack bar 80, it follows that a back and forth movement will be imparted to this rack bar and consequently to the abrasive belts. The clutch 95 is normally automatically actuated, though it may likewise be manually actuated. A manually operable lever 96 is pivoted at 97 to a portion of the frame 5 and is connected by a link 98 with a longitudinally extending trip bar 99 having rounded ends 100 and 101. This bar is pivoted at 102 to a portion of the frame. A link 103 is pivotally connected at 104 to the trip bar 99 and the opposite end of this link is connected with and actuates the clutch 95. It is apparent, therefore, that when the lever 96 is moved in one direction or the other, the clutch will be correspondingly moved. But in addition to this, a trip pin 105 is provided upon the rack bar. When this rack bar reaches its rearward limit of movement, this trip pin contacts with the end 100 of the trip bar and throws the clutch into engagement with the pulley 94. When the rack bar reaches its forward limit of movement, however, the trip pin 105 engages the end 101 and throws the clutch into engagement with pulley 92 to thereby reverse the movement of the rack bar as will be readily understood.

The means for lifting the abrasive belts out of engagement with the floor comprises a manually operable lever 106 that is pivotally connected at 107 with frame 5 and has a rearward extension 108 to which a link 109 is pivotally connected. The opposite end of this link is pivotally connected at 110 to the

rear portion of the guide bar 86. It is apparent, therefore, that if the lever 106 be pulled rearwardly and downwardly, the guide bars will be thrown downwardly at their rear ends and with the roller 81 as a fulcrum, the abrasive belts will be lifted from the floor.

If desired, a shoe 115 may be employed to aid in supporting shaft 38, this shoe having a stem 116 which is encircled by a spring 117 bearing between the shoe and said shaft.

From the foregoing description, it will be seen that simple and efficient means are herein provided for accomplishing the objects of the invention, but while the elements shown and described are well adapted to serve the purposes for which they are intended, it is to be understood that the invention is not limited to the precise construction set forth, but includes within its purview such changes as may be made within the scope of the appended claims.

Having described my invention, what I claim is:

1. In a floor surfacing machine, the combination with a bodily movable frame, of an abrasive belt, means for imparting travel to said belt, and means for imparting a bodily back and forth movement to said belt over the surface to be treated.

2. In a floor surfacing machine, the combination with a bodily movable frame, of an abrasive belt, means for imparting travel to said belt, means for imparting a bodily back and forth movement to said belt over the surface to be treated, and means for bodily elevating said belt to bring it out of contact with the surface acted upon.

3. In a floor surfacing machine, the combination with a bodily movable frame, of an abrasive belt, means for imparting travel to said belt, means for imparting a bodily back and forth movement to said belt over the surface to be treated, means for driving said machine bodily, and means for varying the rate of speed at which the machine is driven.

4. In a device of the character described, the combination with a wheeled supporting frame, of a longitudinally traveling rack bar, means for imparting a back and forth movement to said rack bar, a swinging frame to which said rack bar is connected, rollers mounted in said swinging frame, an abrasive belt passing over said rollers, and means for imparting movement to said abrasive belts.

5. In a device of the character described, the combination with a wheeled supporting frame, of a longitudinally traveling rack bar, means for imparting a back and forth movement to said rack bar, a swinging frame to which said rack bar is connected, rollers mounted in said swinging frame, an abrasive belt passing over said rollers, means for imparting movement to said abrasive belts, and manually operable means for imparting a swinging movement to said rack bar to elevate said abrasive belts.

6. In a device of the character described, the combination with a wheeled frame, of a swinging frame, abrasive belts carried by said swinging frame, a rack bar, a gear wheel engaging said rack bar, said rack bar being connected to said swinging frame, and automatic means for reversing the movement of said gear wheel when the rack bar reaches its limit of movement in either direction.

7. In a device of the character described, the combination with a wheeled frame, of a swinging frame, abrasive belts carried by said swinging frame, a rack bar, a gear wheel engaging said rack bar, said rack bar being connected to said swinging frame, and automatic means for reversing the movement of said gear wheel when the rack bar reaches its limit of movement in either direction, said means comprising a trip lever, a trip pin for engaging said trip lever, a clutch, means connecting said clutch with said trip lever, and driving elements controlled by said clutch, said driving elements driving said gear wheel.

8. In a device of the character described, the combination with a wheeled frame, of a swinging frame, abrasive belts carried by said swinging frame, a rack bar, a gear wheel engaging said rack bar, said rack bar being connected to said swinging frame, automatic means for reversing the movement of said gear wheel when the rack bar reaches its limit of movement in either direction, a roller over which the forward portion of the rack bar rolls, a manually operable lever, and means controlled by said lever for tilting the rack bar upon said roller.

9. In a device of the character described, the combination with a supporting frame, of a swinging frame, abrasive belts carried by said swinging frame, a rack bar connected with said swinging frame, guide bars, rollers carried by the rack bar and engaging said guide bars, and a manually operable lever for bodily tilting said guide bars to thereby lift the swinging frame.

10. In a device of the character described, the combination with a wheeled supporting frame, of a swinging frame, abrasive belts carried by said swinging frame, a suction device carried by said swinging frame and bodily movable therewith, and means for imparting a back and forth movement to said swinging frame.

11. In a device of the character described, the combination with a bodily movable wheeled frame, of a motor mounted thereon, a shaft driven by said motor, a pair of swinging arms extending forwardly and upwardly from said shaft, a second shaft to which the outer ends of said swinging arms

are connected, a pair of downwardly extending swinging arms having pivotal mounting upon said second shaft, rollers mounted at the lower end of said last named swinging arms, drums upon said second shaft, and abrasive belts passing over said drums and over said rollers.

12. In a device of the character described, the combination with a bodily movable wheeled frame, of a motor mounted thereon, a shaft driven by said motor, a pair of swinging arms extending forwardly and upwardly from said shaft, a second shaft to which the outer ends of said swinging arms are connected, a pair of downwardly extending swinging arms having pivotal mounting upon said second shaft, rollers mounted at the lower end of said last named swinging arms, drums upon said second shaft, abrasive belts passing over said drums and over said rollers, and means for driving said second shaft from the first named shaft.

13. In a device of the character described, the combination with a bodily movable wheeled frame, of a motor mounted thereon, a shaft driven by said motor, a pair of swinging arms extending forwardly and upwardly from said shaft, a second shaft to which the outer ends of said swinging arms are connected, a pair of downwardly extending swinging arms having pivotal mounting upon said second shaft, rollers mounted at the lower end of said last named swinging arms, drums upon said second shaft, abrasive belts passing over said drums and over said rollers, and a suction device supported from the second shaft and terminating adjacent the rollers at the lower end of the last named swinging arms.

14. In a device of the character described, the combination with a bodily movable wheeled frame, of a motor mounted thereon, a shaft driven by said motor, a pair of swinging arms extending forwardly and upwardly from said shaft, a second shaft to which the outer ends of said swinging arms are connected, a pair of downwardly extending swinging arms having pivotal mounting upon said second shaft, rollers mounted at the lower end of said last named swinging arms, drums upon said second shaft, abrasive belts passing over said drums and over said rollers, and means for imparting a bodily back and forth swinging movement to the last named swinging arms.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE S. REYNOLDS.

Witnesses:
HERMON REYNOLDS,
H. M. VOLLMER.