April 11, 1961 J. F. SIMMONS 2,978,721

BOWLING ALLEY SANDER AND WAXER

Filed Oct. 14, 1959 2 Sheets-Sheet 1

Fig. 2

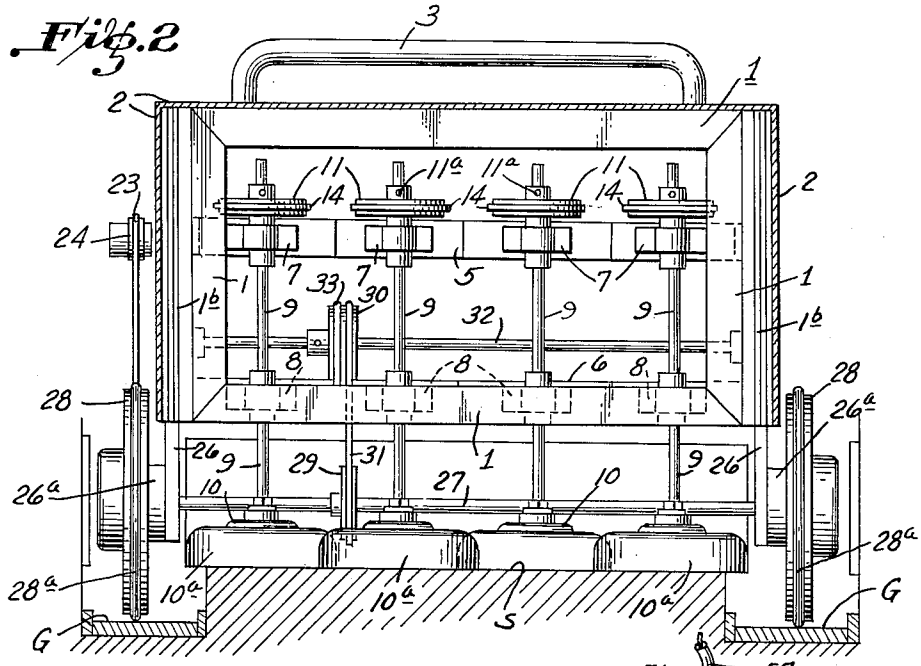


Fig. 1

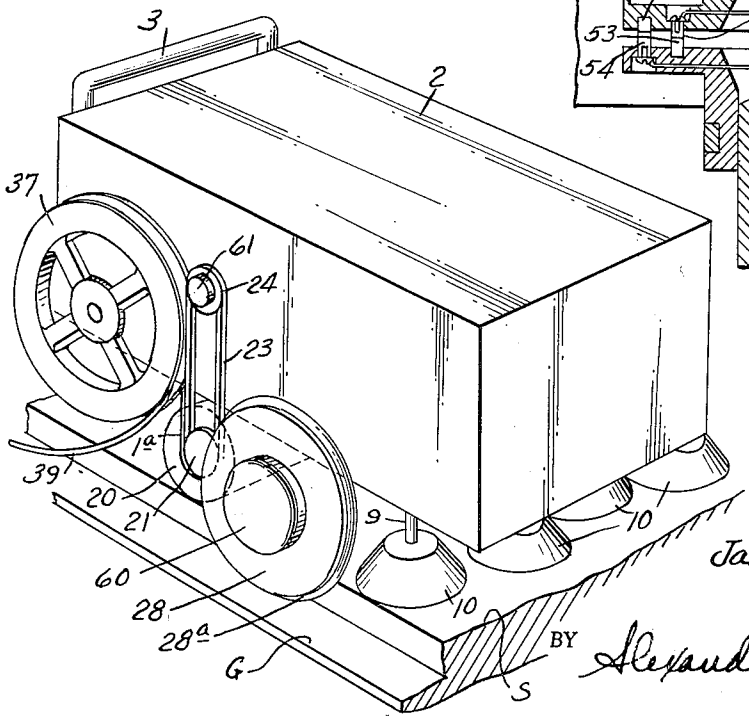
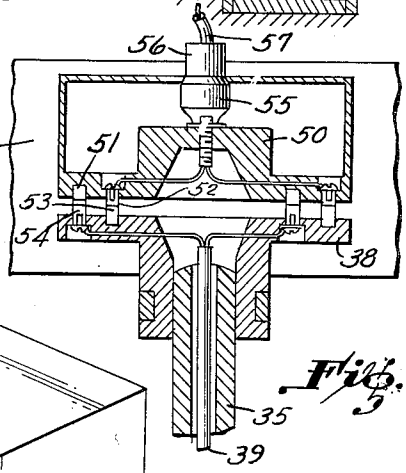


Fig. 5



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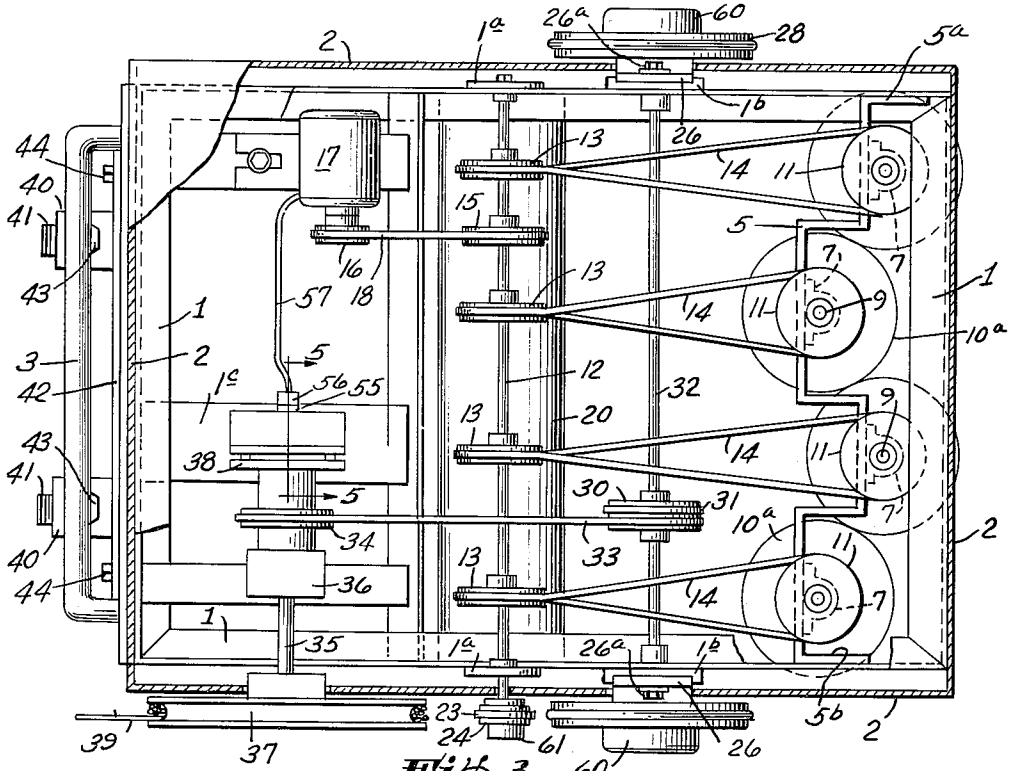


Fig. 3

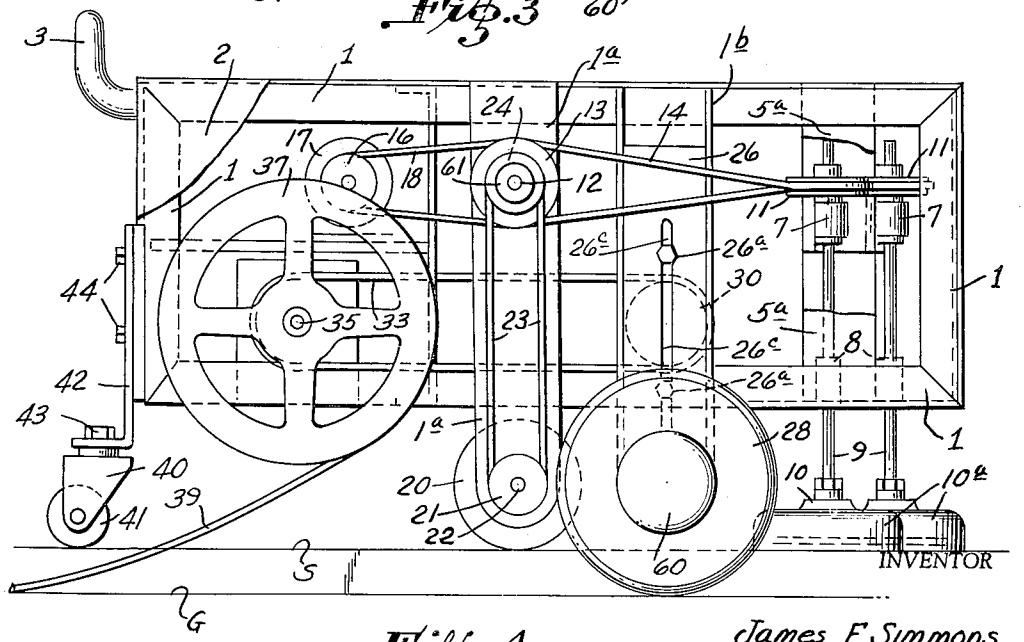


Fig. 4

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BOWLING ALLEY SANDER AND WAXER

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10 Claims. (Cl. 15—98)

This invention relates to floor treating apparatus, and particularly to waxing, polishing and sanding machines of the power-driven type wherein a plurality of spindles carrying polishing heads are rotated in contact with the floor. The present machine also includes a floor-engaging rotating cylinder which also imparts forward motion to the machine.

It is a principal object of my invention to provide a floor polishing machine which is compact and self-contained and which is capable not only of polishing ordinary floor surfaces, but which is especially adapted for the polishing of bowling alleys. The present machine includes floor-engaging wheels on which it travels and which support part of the weight of the machine, and these wheels are adjustable so that they can be arranged to travel in the gutters of a bowling alley and be guided thereby longitudinally along the bowling alley.

It is another important object of my invention to provide a machine having polishing heads and travel wheels so arranged that upon conclusion of the polishing of one bowling alley can be moved to another bowling alley with the polishing heads out of contact with the floor over which the machine is being moved. As the machine is pulled from the bowling alley the supporting wheels rise out of the gutters onto the flat surface at the front of the bowling alley and thereby raise the polishing heads and the polishing cylinder out of contact with the alley until the machine is wheeled onto another bowling alley and the travel wheels drop into the gutters on each side thereof.

Still another object of my invention is to provide a machine driven by an electric motor, and to provide means for automatically reeling the electric power cord in and out as the machine travels back and forth on the bowling alley, the reel being coupled with the travel wheels of the machine so that the rate at which the cord is reeled in, or paid out, corresponds exactly with the rate at which the machine is moving along the alley.

Another object of the invention is to provide a machine the weight of which is supported on two travel wheels and additionally supported on caster means, and wherein the height of the wheels and casters with respect to the frame of the machine is adjustable so as to permit adjustment of the pressure of the polishing heads and the polishing cylinder on the surface to be polished.

Other objects and advantages of the invention will become apparent during the following discussion of the drawings, wherein:

Fig. 1 shows a perspective view of a polishing machine according to the invention, the machine resting on a bowling alley;

Fig. 2 shows an enlarged front elevation of the machine with the front cover broken away so as to make a part of the drive means visible;

Fig. 3 is a plan view of the machine shown in Fig. 2 with the top cover broken away so as to make the transmission and drive means within the machine visible;

Fig. 4 is a side elevation view of the machine with the side cover broken away so as to make the drive and transmission means visible within the machine; and

Fig. 5 is an enlarged section view taken along line 5—5 of Fig. 3.

Referring now to the drawing, the machine is shown supported on a bowling alley having a bowling surface S and having two gutters G, the machine including a frame 1 comprising a box made of angle iron members and having upper, lower and side portions of the frame. The frame is enclosed by a suitable cover 2 which is seen best in Fig. 1, but which may be seen in cross section in Figs. 2, 3 and 4. A handle 3 is disposed across the rear of the machine and is connected to the frame 1, and serves to assist in handling and guiding the machine. Within the frame 1 are zigzag upper and lower supporting members 5 and 6 having flanges such as 5*a* and 5*b*, Fig. 3, by which the supporting member 5 is attached to the frame 1. These supporting members are employed to retain upper bearing blocks 7 in alignment with lower bearing blocks 8.

In each of the pairs of upper and lower bearing blocks 7 and 8 is journaled a spindle 9, these spindles extending below the machine and each carrying a polishing head 10 of the type shown in Fig. 1, over which is placed a polishing bonnet 10*a*, as can be seen in Figs. 2 and 4. Near the upper end of each of the spindles 9 is a pulley 11 attached to the spindle by means of a set screw 11*a* which can be loosened when adjusting the height of any of the spindles with respect to any of the other spindles.

On either side of the frame 1 is an upright frame member 1*a*, Figs. 3 and 4, and a shaft 12 disposed transversely of the machine and carried in suitable bearings in the uprights 1*a*. The shaft 12 carries four pulleys 13 secured thereto, a belt 14 being stretched between each of the four pulleys 13 and an associated pulley 11 carried by a spindle. The belt directions are alternately reversed so that the directions of rotation of alternate spindles is opposite. By this means, any translatory motion tending to throw the machine off of a straight-line of travel is avoided.

The shaft 12 also carries a pulley 15 which is located opposite a pulley 16 mounted on the shaft of a drive motor 17, and occupied to the pulley 15 by means of a belt 18. The motor 17, the shaft 12, and the pulleys 13, 15 and 16 have been omitted from Fig. 2 for the sake of simplification.

The uprights 1*a* also extend below the frame of the machine and support the shaft 22 of a transverse cylinder 20, the lower periphery of which is tangent to the horizontal plane which also includes the disc-like faces of the polishing heads 10. A pulley 21 is connected for unitary rotation with the shaft 22 on which the cylinder 20 is mounted, and this pulley is connected by a belt 23 to an upper pulley 24 which is carried at one end of the shaft 12.

Additional upright members 1*b* are fixed to each side of the frame 1, and these upright members have flanges on each side between which are confined the upper portions of brackets 26. These brackets carry hub portions 26*a* at their lower ends and support a transverse shaft 27 which carries a pair of travel wheels 28 which support part of the weight of the machine on rubber tires 28*a*. The wheels 28 are keyed to the shaft 27 for unitary rotation therewith, and a pulley 29 is also keyed to this shaft and connected with a double pulley 30 by means of a belt 31. The double pulley 30 is supported on a shaft 32 which is disposed transversely of the frame, and the other sheave of the pulley 30 is connected by a belt 33 with a pulley 34 mounted on a shaft 35 which is supported on a bearing 36. The shaft 35 is a hollow shaft, as can be seen in Fig. 5, and extends from a reel 37 into a slipring plate 38, Fig. 5. The reel carries an

electric cord 39 wound thereon. The cord 39 is passed at its inner end through the hollow shaft 35 and into the slipring plate 38, as will be described hereinafter.

The vertical portions of the brackets 26 can slide up and down in the uprights 1*b*, and several bolts 26*a* are provided for locking the brackets 26 in one of a plurality of positions which can be selected by loosening the bolts 26*a*. The brackets 26 are provided with slots 26*c* through which these bolts are passed and which permit adjustment of the height of the ground-engaging travel wheels 28.

The machine is further supported on one or more casters 40, including ball-bearing caster wheels 41, said casters being secured to a caster bracket 42 by means of bolts 43 which can be left loose so as to permit the casters 40 to swivel and thereby permit the machine to be steered, or which can be tightened down so as to hold the caster wheels 41 in longitudinal position so that the machine will travel straight down the bowling alley without further steering. The vertical position of the bracket 42 is maintained by bolts 44 which when loosened permit the height of the bracket to be adjusted so as to cause the caster wheels 41 to carry their share of the weight of the machine, and so as to position the cylinder 20 and the buffing heads 10 correctly on the surface to be polished.

Returning now to the slipring assembly, as shown in Figs. 3 and 5, the slipring assembly is carried on a frame member 1*c* and includes a rotary plate bearing the reference character 38 connected with the shaft 35 and a stationary portion 50 which is supported on the frame member 1*c*. The stationary portion 50 of the slipring assembly carries an outer slipring 51 and a brush 52 spaced inwardly therefrom. Conversely, the rotary plate 38 of the assembly carries an inner slipring 53 and an outer brush member 54. When the plate 38 is rotated with respect to the portion 50, the brushes and sliprings are in mutual contact so as to transfer power from the power cord 39 into a receptacle 55 into which a plug 56 is connected, the plug 56 having a length of cable 57 which carries power to the electric motor 17. A suitable switch (not shown) may be interposed, if desired, in one or other of the cables 39 or 57 so as to render control of power to the motor more convenient from the machine itself.

In addition, I have provided my machine with bumpers 60 and 61 so as to reduce the likelihood of damage to the bowling alleys when the machine is traveling therealong.

Operation

With the wheels and the casters adjusted to the heights shown in Fig. 4, the machine can be wheeled up to the bowling surface S of a bowling alley, and then run forwardly thereon so that the wheels 28 travel into and along the gutters G of the alley. The cylinder 20 may either drive a sanding belt in case the alley is to be refinished, or alternatively can carry a buffing cover for polishing the alley during a waxing operation. In either event, the motor 17 drives the cylinder 20 via the belts 18 and 23, and also drives the four vertical spindles 9 through the belts 14. Inasmuch as the spindles 9 rotate in alternately opposite directions, the net translatory effect of their engagement with the surface S of the alley will be zero. However, inasmuch as the cylinder is rotating in one direction or the other, the machine will be driven longitudinally of the alley. If desired, a reversible motor may be used as the drive motor 17 and a reversing switch (not shown) can be used so as to cause the motor to propel itself both up and down on the bowling alley.

No drive is directly furnished from the motor 17 to the wheels 28 and therefore the rate of drive of the machine will be determined by the amount of slippage of the cylinder 20 on the surface S, which slippage can be adjusted by adjusting the height of the exterior bracket 42 on the frame 1.

It is to be noted that the caster wheels 41, the cylinder 20, and the buffing heads 10 are all mounted at the same height with respect to the frame 1, and that only the wheels 28 extend below the plane of the buffing heads, and the cylinder 20. Therefore, if it is desired to employ the machine on a flat floor area, as distinguished from a bowling alley, it is only necessary to loosen the bolts 26*a* and raise the brackets 26 upwardly in the uprights 1*b* until the lower peripheries of the rubber tires 28*a* also lie in the common plane. The machine can then be used for treating flat floor areas.

I do not limit my invention to the exact form shown in the drawings, for obviously changes may be made therein within the scope of the claims.

I claim:

1. A self-propelled machine for polishing the portion of a bowling alley surface lying between its gutters, comprising a frame; vertical spindle means journaled in the frame and depending therebelow; polishing head means disposed in a horizontal plane and carried at the lower end of the spindle means, said head means covering substantially the width of said surface; polishing cylinder means journaled transversely of the frame and disposed tangent to said horizontal plane and thereabove; a motor carried by said frame; transmission means connecting rotary drive from the motor to the spindle means and to the cylinder means, the latter driving the machine longitudinally forwardly; alley engaging wheels journaled on axes disposed transversely of the frame, said wheels extending below said horizontal plane and traveling in the gutters of the alley to guide the machine along said surface of the alley; and means for adjusting the distribution of weight between the head means and the cylinder means.

2. In a machine as set forth in claim 1, said motor being electrically driven and having a power cord at least as long as said alley; a reel journaled on said frame on a transverse axis and carrying the power cord coiled thereon; and drive means connecting the reel with at least one of said wheels for rotation therewith, whereby the power cord is reeled in and out as the machine is moved longitudinally of the alley.

3. In a machine as set forth in claim 2, said reel being mounted on a shaft for rotation therewith, said shaft being hollow and said cord passing therethrough to the reel; and slip-ring means connected with the shaft and connecting the cord with the motor.

4. In a machine as set forth in claim 1, said wheels being supported on brackets; screw means for connecting the brackets with the frame, said screw means being adjustable whereby the vertical positions of the wheels may be adjusted with respect to said horizontal plane.

5. In a machine as set forth in claim 4, a caster bracket disposed transversely across the frame on the other side of the cylinder means from said wheels; caster means carried by the bracket and engaging the alley surface; and securing means adjustably connecting the caster bracket to the frame.

6. A self-propelled machine for polishing floor surfaces, comprising a frame; vertical spindle means journaled in the frame and depending therebelow; polishing head means disposed in a horizontal plane and carried at the lower end of the spindle means; polishing cylinder means journaled transversely of the frame and disposed tangent to said horizontal plane and thereabove; a motor carried by said frame; transmission means connecting rotary drive from the motor to the spindle means and to the cylinder means, the latter driving the machine longitudinally forwardly; floor-engaging wheels journaled on an axis disposed transversely of the frame between the cylinder means and the head means, the heights of said wheels being adjustable with respect to the frame; and second floor-engaging means carried by the frame and

longitudinally spaced from said wheels and vertically adjustable to adjust the distribution of weight between the wheels and the polishing cylinder to adjust the traction of the latter on the floor surface.

7. In a machine as set forth in claim 6, said motor being electrically driven and having a power cord; a reel journaled on said frame on a transverse axis and carrying the power cord coiled thereon; and drive means connecting the reel with at least one of said wheels for rotation therewith, whereby the power cord is reeled in and out as the machine travels on said surface.

8. In a machine as set forth in claim 7, said reel being mounted on a shaft for rotation therewith, said shaft being hollow and said cord passing therethrough to the reel; and slip-ring means connected with the shaft and connecting the cord with the motor.

9. In a machine as set forth in claim 6, said wheels being supported on brackets; screw means for connecting the brackets with the frame, said screw means being adjustable whereby the vertical positions of the wheels may be adjusted with respect to said horizontal plane.

10. In a machine as set forth in claim 9, a caster bracket disposed transversely across the frame on the other side of the cylinder means from said wheels; and said second floor-engaging means comprising caster means carried by the bracket and engaging said surface; and securing means adjustably connecting the caster bracket to the frame.

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