No. 874,549. PATENTED DEC. 24, 1907.

J. F. STOLL.

SURFACING MACHINE.

APPLICATION FILED JULY 30, 1906.

4 SHEETS—SHEET 1.

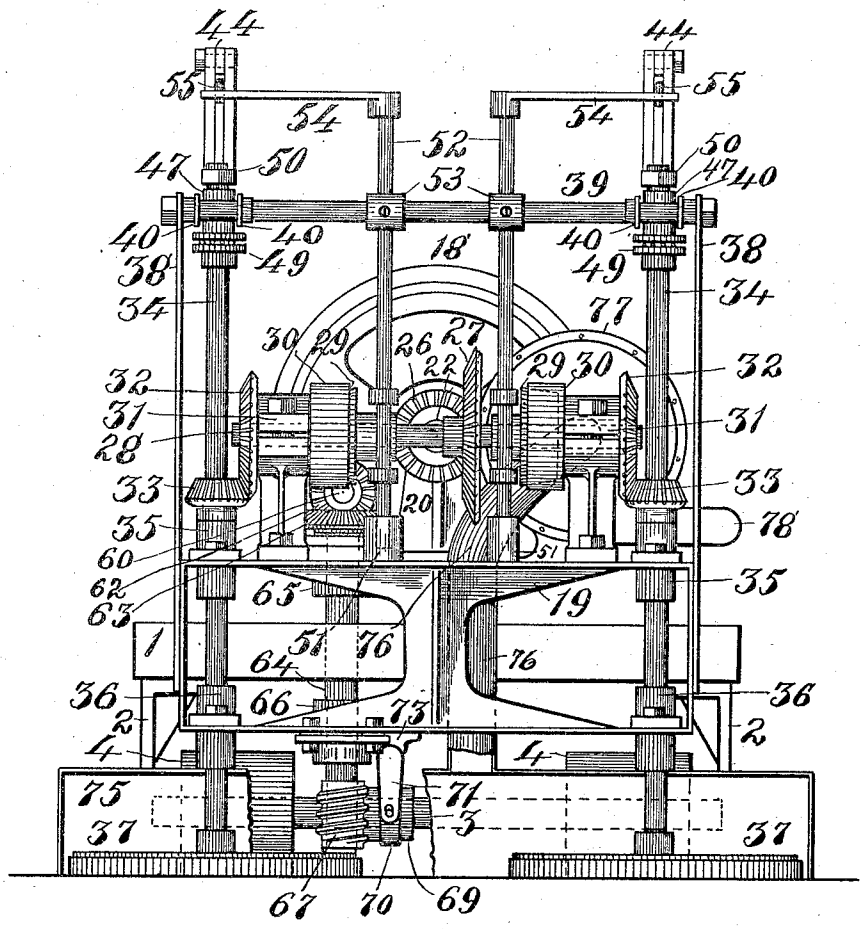


Fig. 1.

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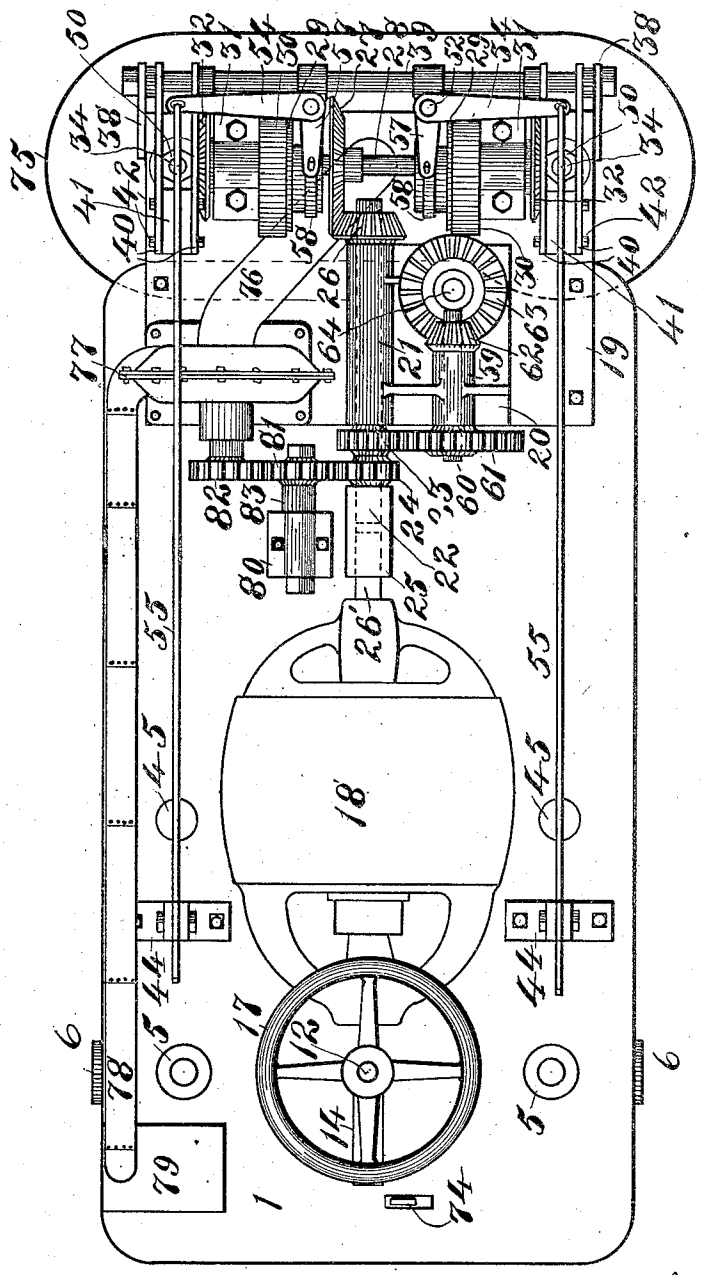


Fig. 2.

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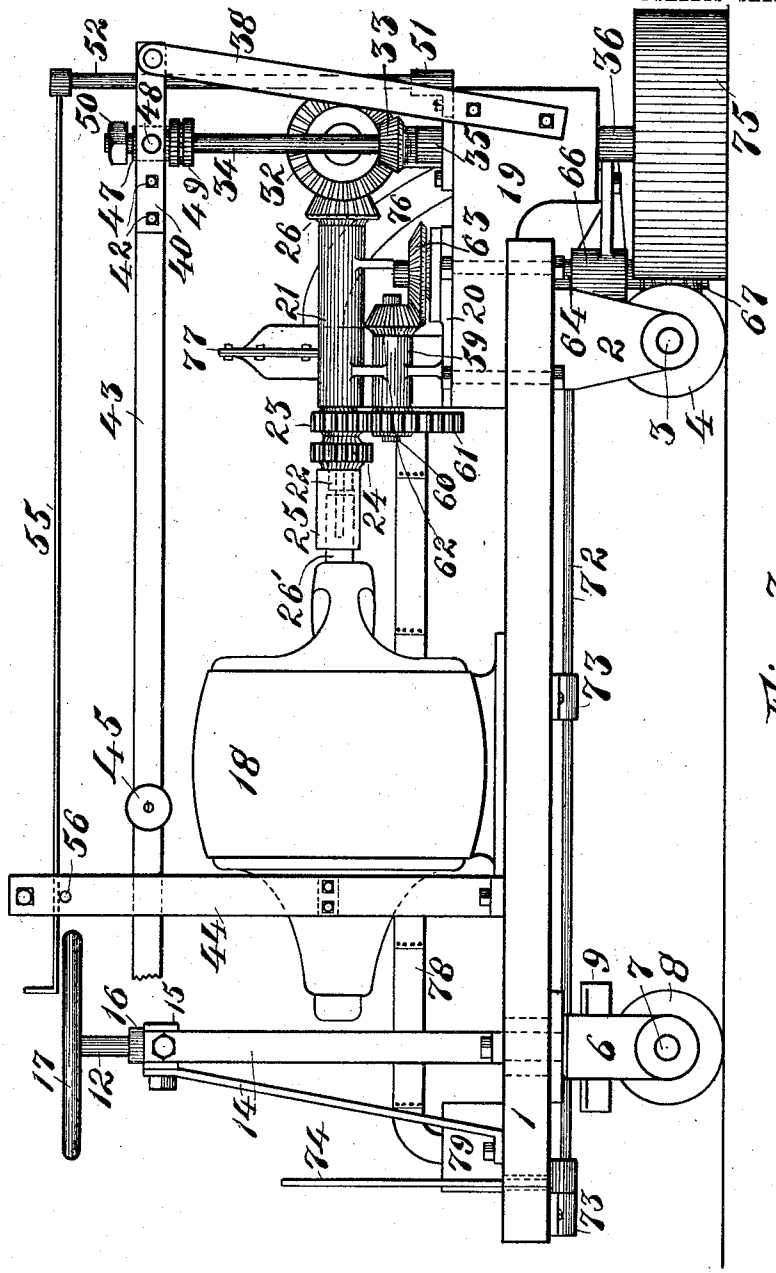


Fig. 3.

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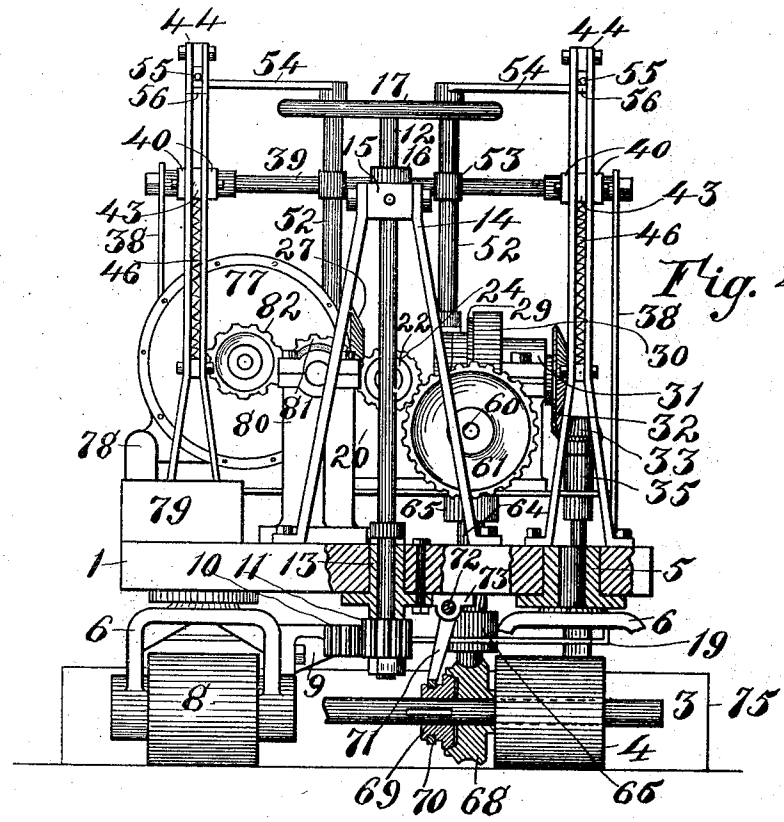


Fig. 4.

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UNITED STATES PATENT OFFICE.

JOHN F. STOLL, OF CUYAHOGA FALLS, OHIO.

SURFACING-MACHINE.

No. 874,549. Specification of Letters Patent. Patented Dec. 24, 1907.

Application filed July 30, 1906. Serial No. 328,372.

To all whom it may concern:

Be it known that I, JOHN F. STOLL, a citizen of the United States residing at Cuyahoga Falls, in the county of Summit and State of Ohio, have invented new and useful Improvements in Surfacing-Machines, of which the following is a specification.

This invention relates to improvements in machines for surfacing floors, bowling-alleys, etc., and the object thereof is to provide an efficient, simple and relatively inexpensive device by which the surfaces of floors may be ground, smoothed and polished, all of which operations are included in the general term of "surfacing," and this term will be used throughout the specification and claims.

With the foregoing and other objects in view, the invention consists in the novel construction, combination and arrangement of parts constituting the invention to be hereinafter referred to and illustrated in the accompanying drawings which form a part of this specification in which is shown the preferred embodiment of the invention, but it is to be understood that changes, variations and modifications can be resorted to which come within the scope of the claims hereunto appended.

In the drawings, in which similar reference numerals indicate like parts in the different figures: Figure 1 is a front elevation of my device with portions thereof broken away to make the understanding of the illustration clearer; Fig. 2 is a plan; Fig. 3 is a side elevation; and Fig. 4 is a rear elevation with certain parts omitted and other parts in section to illustrate more clearly the construction of the device.

Before proceeding to a detailed description of the mechanism of this device, it will be stated that it consists of a truck suitably mounted on wheels provided with a steering apparatus and carrying an electric motor by which the surfacing mechanism is operated, as well as means provided for the propulsion of the truck. This motor is connected by current-conducting wires of sufficient length to permit a comparative free travel of the truck over the floor.

Describing specifically the mechanism illustrated in the drawings, the reference numeral 1 designates the body of the truck which is made of sufficient strength to sustain the mechanism mounted thereon. The forward end of this truck is provided on its under face with a pair of fixed brackets 2, through which extends a shaft 3 on which are tightly mounted wheels 4. The rear end of the truck is supported and the device steered by the following mechanism:

Revolubly mounted in suitably-disposed bushings 5 are a pair of caster frames 6 each provided with a shaft 7, and on these shafts are loosely mounted wheels 8. In order to control the movement of these rear wheels, there is fastened to the inside of each of these frames 6 a bracket 9 having the outer face thereof formed with spur teeth and constituting a segmental rack gear 10. Between these rack gears 10 is a pinion 11 mounted at the lower end of an upright revoluble shaft 12 which is mounted in a suitable bushing 13 constituting a lower bearing for the shaft, the upper portion of which is supported by a tripodal structure consisting of side and rear braces 14 attached at the lower ends to the upper face of the truck 1, and at their upper ends to a bearing 15. Above the bearing 15 is a collar 16 to retain the shaft in position. The upper end of this shaft is provided with a hand wheel 17 by which the movements of the shaft 12 and the wheels 8 are controlled.

The mechanism for surfacing the floors and for propelling the vehicle is as follows:

Mounted on the truck 1 in front of the steering wheel 17 is an electric motor 18 which is supplied with current from any ordinary current conveying means; but the type thereof is immaterial to this invention, and the particular style of motor and the means of controlling the same is discretionary with the builder of the device, and it will be stated that in the illustrations only the outline of a motor is shown in order to indicate its position with reference to the other mechanism.

Mounted on the front end of the truck 1 is a frame 19 provided with a depending front end. Upon this frame is mounted an upright housing 20 having in its upper portion an elongated bearing 21 in which is freely mounted a shaft 22. The rear end of this shaft where it projects from the bearing 21 bears two gear-wheels 23 and 24, and the outer end thereof beyond the gear 24 is splined and arranged to receive a collar 25 which connects it with the motor shaft 26' which is spaced therefrom and also splined so that any longitudinal movement which takes place in the motor shaft will cause no

injury to the mechanism which is driven thereby. On the forward end of the shaft 22 is a beveled pinion gear 26. This pinion 26 is adapted to intermesh with a beveled gear 27 mounted tightly on a horizontal transverse shaft 28. This shaft 28 also bears a pair of friction clutches, each consisting of a male member 29 splined thereto and a loose female member 30 provided with a sleeve, indicated in dotted lines in Fig. 1 and revoluble on the shaft 28. Mounted on the upper face of the frame 19 are two upright brackets 31 provided at their upper ends with journal bearings to receive the sleeve portions of the female members 30 of the friction clutches thereby sustaining the shaft 28 in position. Mounted on the outer face of the sleeve portions of the female members 30 of the clutch are a pair of beveled gears 32 which are adapted to intermesh with beveled pinion-gears 33 splined on vertical, parallel and rotatable shafts 34, in order to permit the free vertical sliding of these shafts without interruption. The shafts 34 are mounted in two bearings 35 and 36 secured to the upper and lower faces respectively, of the front portion of the frame 19.

On the lower ends of each of the shafts 34 is a surfacing disk 37. It will be here stated that the make up of these surfacing disks is immaterial to the description of this device for the reason that various types and forms of such wheels may be placed on the lower ends of the shafts 34, each of which is designed to perform a different function in grinding, polishing, abrading or smoothing of a floor. This will be easily illustrated by the following example: If the wood of the floor which is to be surfaced is hard-wood, a different form of disk would be employed than that which would be employed for soft-wood. Again, a different form of disk would be employed in making the first cut or "roughing" of the wood than that which would be employed for polishing the same after being smoothed, and hence a description of the disks themselves is believed to be superfluous in this specification.

To maintain a definite and preferable amount of pressure on the disks in order to make them perform their functions in the best possible manner, the following mechanism is employed: Attached to the outer front side-faces of the frame 19 are a pair of upwardly-extending standards 38, suitably perforated at their upper ends to receive a transverse, horizontal rod 39 which is preferably held in position by means of nuts outside of the standards 38. Pivotally secured to the rod 39 are the front ends of parallel bars 40, the members of each pair being united at their rear ends to blocks 41 by means of bolts 42. These blocks 41 are intended to clamp between them a rearwardly-extending beam 43, the rear end of each of which is permitted to oscillate vertically and is guided and steadied by an upright standard consisting of parallel members 44, the lower ends of which are secured to the upper face of the truck 1. These beams 43 may bear a weight 45 which is slidable thereon and is used to produce a necessary pressure upon the shafts 34.

In order to further regulate and control the amount of pressure exerted by each beam 43 upon the shafts 34, I place between each of the members 44 of the upright guides a coiled spring 46 which rests upon blocks suitably sustained between the members of each pair. The bars 40 and beam 43 on each side of the device constitute a yoked lever, and in order to engage the shaft 34 there is placed between the bars 40 a clevis 47 which is perforated to receive the shaft 34 and is provided with side trunnions 48 which pass through suitable openings in the bars 40. Below the clevis 47 there is placed on each of the shafts 34 a ball or roller-bearing 49 the lower members of each of which are secured to the shaft and serve to sustain the clevis 47 and its connected mechanism in position, as well as reduce the friction incident to the rapid rotation of the shafts 34. I customarily place on the upper ends of the shafts 34 nuts 50, so that when the beams 43 are raised the disks will be lifted from the floor. The friction clutches mounted on the shaft 28 are used to control the rotation of the shafts 34 and surfacing disks 37. These friction clutches are manipulated and thrown into and out of operation by the following mechanism: Mounted on the front upper face of the frame 19 are a pair of step bearings 51 in which are freely mounted upright shafts 52, and these shafts are supported near their upper face by passing through bearings 53 attached to the cross rod 39. These shafts each bear at their upper end an arm 54 to which is attached a rod 55 which passes backward through the opening between the members 44 and is supported by a pin 56 so that the free end thereof will be within easy reach of the operator who is steering the device. The motion produced by the rod 55 is communicated to the male member of the clutch which is splined on the shaft 29 and revolves therewith by means of two arms 57 on the upright shafts 52 which engage pins on loose collars 58 on the hubs of the male members of each clutch. It will be apparent that by manipulating either of the rods 55, a simultaneous movement of the male member of the respective clutch to which it is connected will result, and the member is thrown into and out of operative engagement with the female member which produces motion in the respective shaft 34 or a cessation of movement as desired.

In order to enable the device to propel itself on a floor the following mechanism is employed: On the housing 20 and parallel

with the bearing 21 is a second bearing 59 in which is freely mounted a shaft 60 which bears at its rear end a large gear 61 which intermeshes with the gear 23 on the shaft 22 and receives motion thereby. On the forward end of the shaft 60 is a beveled pinion gear 62 adapted to intermesh with a beveled gear 63 mounted on a vertical shaft 64 suitably mounted for rotation in an upper bearing 65 and a lower bearing 66 attached to the frame 19. The lower end of this shaft 64 bears a worm 67 which is adapted to engage and intermesh with a worm-wheel 68 (see Fig. 4) loosely mounted on the shaft 3 and adjacent one of the wheels on said shaft. This worm-wheel is so formed on one side as to constitute the female member of a clutch, the corresponding male member 69 of which is splined to the shaft 3 and is provided with a loose collar 70 to which are connected a pair of arms 71, fixedly mounted on a revoluble, longitudinal shaft 72 properly supported by bearings 73 and provided at its rear end with a hand lever 74 preferably situated within easy reach of the person who is steering the device.

It will be seen from the foregoing that as the shaft 22 is operated by means of the motor 18, motion is transmitted through the mechanism just described tc the worm and from thence to the worm-wheel, and from thence by means of the male member 69 to the axle of the forward wheels of the device so that the device is propelled by the same power used for rotating the disks. In order to collect the dirt and dust arising from the action of the disks 37, I inclose these two disks in an elongated hollow sheet metal casing 75 from which leads an eduction pipe 76 to a fan 77 and from thence the air and dust is transported by means of the conveying pipe 78 to a receptacle 79.

It is believed that a detailed description of the receptacle 79 will be superfluous in this specification as any form of dust or dirt-collecting receptacle may be used in connection with this device.

In order to rotate the fan 77, I mount on the truck 1 an upright bracket 80 having in its upper portion a bearing for a shaft on which is mounted in adler gear 81 arranged to intermesh with the gear 24 on the shaft 22. This idler 81 is designed to mesh with a gear 82 on the shaft of the fan, and thus motion is communicated from the main shaft 22 to the fan-shaft through the intermeshing gears and the rotation of the fan thereby secured. Between the bracket 80 and the idler 81, I place a collar 83 which may be in the form of a horseshoe if desired to permit its ready removal. If it is desired to stop the operation of the fan, this collar 83 is removed and the idler 81 slipped along the shaft on which it is mounted until it is no longer in mesh with the gear 24.

What I claim and desire to secure by Letters Patent is:—

1. A self propelled surfacing machine comprising a truck, means carried by the truck for propelling it, a frame depending from the forward portion of the truck, bearings secured to the frame, a vertical shaft extending through said bearings and depending below the frame, a surfacing tool carried by the shaft, motion transmission mechanism driven from said means and adapted to operatively connect with said shaft intermediate the ends thereof for rotating it and embodying a clutch device for operatively-connecting and disconnecting said mechanism to and from said shaft, a pressure device engaging with the shaft for maintaining a predetermined pressure upon the tool, means for regulating said pressure device, a housing for the tool, a suction device mounted upon the truck at a point removed from the forward end thereof, said suction device independent of said tool carrying shaft whereby the said device can be operated independent of the tool, mechanism for transmitting motion from said propelling means to the suction device, and a conduit between said suction device and said housing.

2. A self-propelled surfacing machine comprising a truck, means carried by the truck for propelling it, a frame depending from the forward portion of the truck, bearings secured to the frame, a vertical shaft extending through said bearings and depending below the frame, a surfacing tool carried by the shaft, motion transmission mechanism driven from said means and adapted to operatively connect with said shaft intermediate the ends thereof for rotating it and embodying a clutch device for operatively connecting and disconnecting said mechanism to cover said shaft, a pressure device engaging with the shaft for maintaining a predetermined pressure upon the tool, means for regulating said pressure device, a housing for the tool, a suction device mounted upon the truck at a point removed from the forward end thereof, said suction device independent of said tool carrying shaft whereby the said device can be operated independent of the tool, mechanism for transmitting motion from said propelling means to the suction device, a conduit between said suction device and said housing, a receptacle carried by the truck, and a conducting pipe between said suction device and said receptacle.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN F. STOLL.

Witnesses:
C. E. HUMPHREY,
GLENARA FOX.