F. L. CUMMINGS & E. HATHAWAY.

FLOOR SURFACING MACHINE.

APPLICATION FILED AUG. 15, 1907.

959,721. **Patented May 31, 1910.**

Fig. 3.

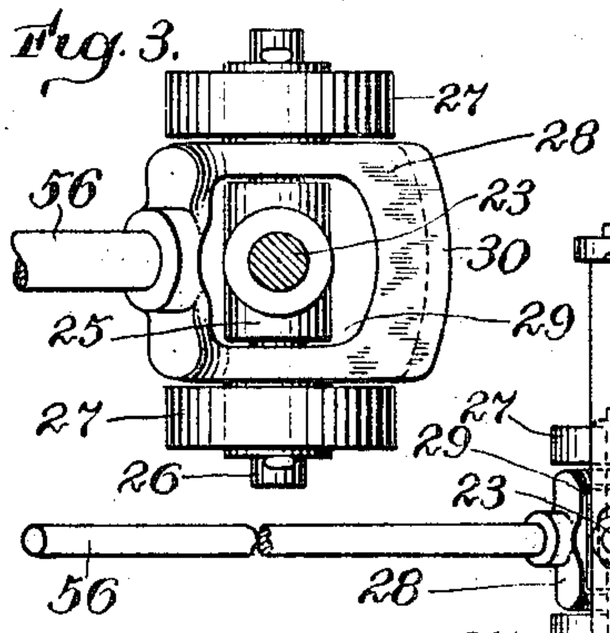

Fig. 1.

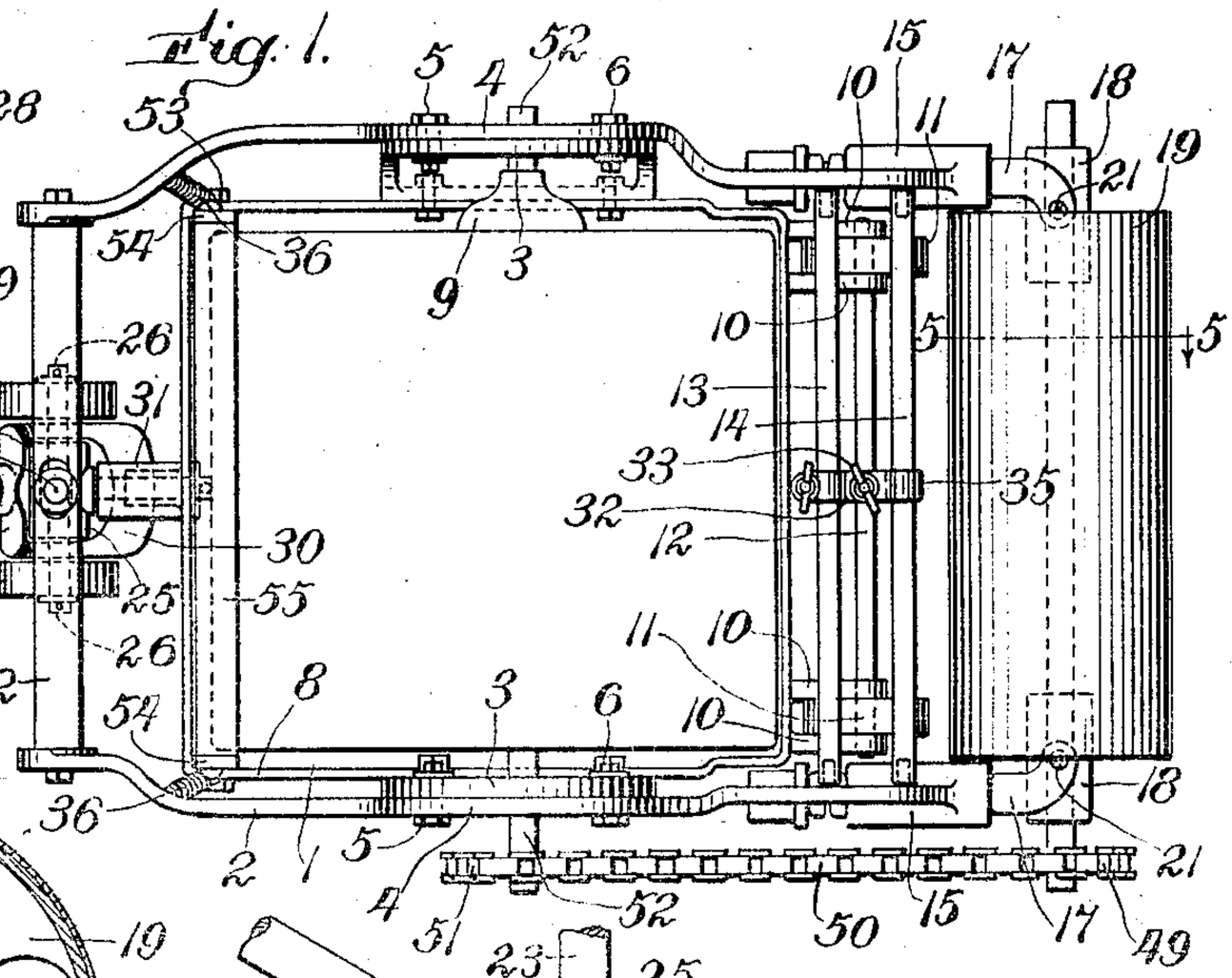

Fig. 5.

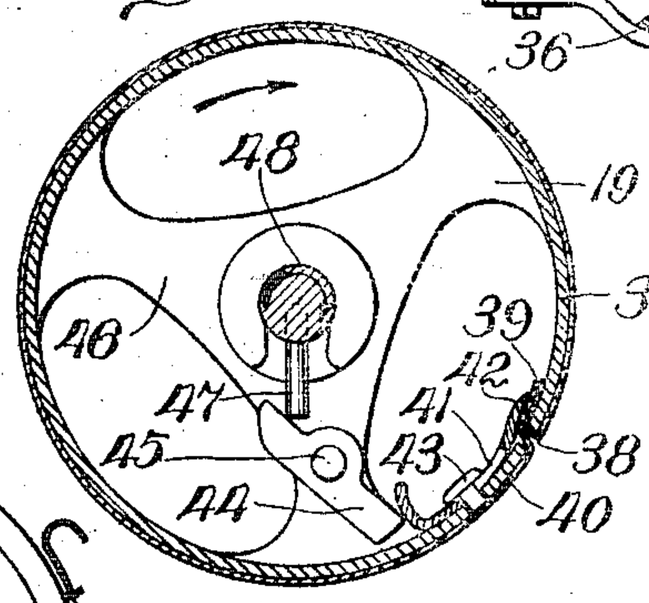

Fig. 4.

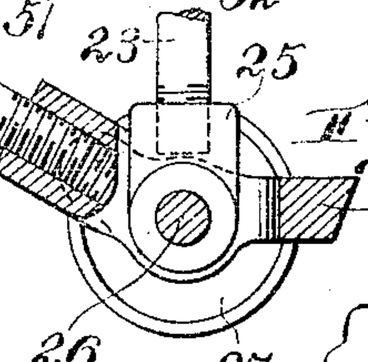

Fig. 6.

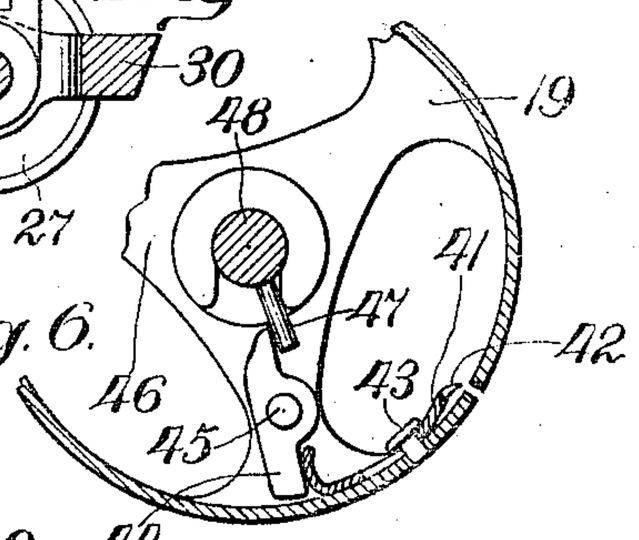

Fig. 2.

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UNITED STATES PATENT OFFICE.

FREDERICK L. CUMMINGS, OF EVERETT, AND EDWARD HATHAWAY, OF MALDEN, MASSACHUSETTS.

FLOOR-SURFACING MACHINE.

959,721. Specification of Letters Patent. Patented May 31, 1910.

Application filed August 15, 1907. Serial No. 388,645.

To all whom it may concern:

Be it known that we, FREDERICK L. CUMMINGS and EDWARD HATHAWAY, citizens of the United States, and residents of Everett, in the county of Suffolk, and Malden, in the county of Middlesex, both in the State of Massachusetts, have invented an Improvement in Floor-Surfacing Machines, of which the following description, in connection with the accompanying drawings, is a specification, like numerals on the drawings representing like parts.

Our invention is a floor-surfacing machine of the kind in which the abrading roll is driven by power, preferably an electric motor carried by the machine, for use in leveling the floors of bowling alleys and the like.

In accomplishing the delicate results required in leveling bowling alleys, it is frequently necessary to halt in the progress of the work, for various reasons, as to back up the machine so as to do over a given place, or to adjust some part, or give attention otherwise to the machine, and the like, and we have discovered that many of the irregularities and difficulties of surfacing are due to the continued running of the abrading roll when the machine is stopped. Theoretically, the roll cuts off the surface level and cannot do more, but we have found that in practice the roll will cut down slightly deeper wherever it is permitted to operate longer than elsewhere. Accordingly, we have aimed to produce an exceedingly simple machine constructed to obviate the above mentioned disadvantage, our invention also including certain other features, all as will be more apparent from the following description, reference being had to the accompanying drawings, in which we have represented a preferred embodiment of the invention.

In the drawings, Figure 1 is a plan view of the machine; Fig. 2 is a view thereof in side elevation, partly broken away; Figs. 3 and 4 are details respectively in plan and cross section of a rear portion of the machine; and Figs. 5 and 6 are cross sectional details of the abrading roll at the front of the machine, taken as indicated by the arrow 5, Fig. 1.

The machine proper comprises an inner frame 1 and an outer frame 2, provided respectively with upwardly projecting ears 3, 4 at about the middle of their opposite sides connected by bolts 5, 6, one of the parts, herein shown as the ears 4, being slotted as indicated at 7 to permit of a relative pivotal movement between the two frames. The frame 1 is box-like, having relatively high raised sides 8, to give great rigidity and strength to the machine, and also to form a suitable housing or receptacle for an electric motor 9. At its forward end the frame 1 is provided at its opposite corners with ears 10, in which are journaled rolls 11 on a shaft 12 for bearing a large part of the weight of the machine. The frame 2 has its opposite side members connected at their front ends by rods 13, 14, and provided with forwardly extending longitudinal sleeves or journal bearings 15, in which are swiveled the shanks 16 of a yoke 17, which pivotally carries at its outer end the horizontal journals 18 of an abrading roll 19, said shanks 16 being longitudinally adjustable by nuts 20, threaded on their inner ends in a shouldered recess in the bearing 15, as clearly shown in Figs. 1 and 2. The opposite ends or horizontal journals 18 of the abrading roll are vertically adjustable in the yoke 17 by small set bolts 21. Thus, it will be seen that the abrading roll may be adjusted with extreme delicacy forward or backward at either or both ends by means of the nuts 20, and upward or downward by the bolts 21, the swivel bearings 16, 17 permitting entire freedom of adjustment and operation. At their rear ends the side portions of the outer frame 2 are loosely connected by a transverse bar 22, from which depends a post 23 which passes loosely through a sleeve or long cylindrical casting or bearing 24, and is screwed into a block 25 at its lower end mounted on a transverse shaft 26, at whose opposite ends are truck wheels 27 similar to the wheels 11 for bearing the weight of the front end of the machine. The shaft 26 is horizontally journaled in an approximately rectangular casting 28 centrally apertured at 29 to receive and retain loosely the block 25. The rectangular casting or yoke piece 28 has a heavy forwardly projecting lip 30, which bears against the shouldered end of the frame 2 above it. The sleeve or vertical bearing casting 24 has a heavy stem 31 secured horizontally in the rear end of the frame 2 for permitting said sleeve to swivel and yet transmit to the truck wheels 27 the

weight of that end of the machine. The post 23 serves as the means for holding together the two frames and preventing their separation at their rear ends.

At the front end of the machine we preferably provide a rod 32 which hooks over the shaft 12 at its lower end, and is provided with a nut 33 at its upper end engaging a spring 34 bringing positive and constant downward abrading-pressure upon the abrading roll 19, said rod 32 passing through a transverse clip 35 removably and adjustably secured to the two rods 13 and 14, as clearly shown.

Adjacent their rear corners the two frames 1 and 2 are connected by spring 36 for giving delicacy of balance, and, in coöperation with the adjustable spring 34, giving accuracy of abrading-pressure.

The roll 19 comprises a cylindrical shell 37 having a longitudinal slot 38 for receiving the opposite ends 39 of the sand-paper or emery paper 40, as shown clearly in Figs. 5 and 6. We have found that considerable unevenness in results is due to the fact that the abrading roll does not have an absolutely uniform and smooth surface, and accordingly we have provided a slit 38 just wide enough for receiving the two ends of the paper, and a sliding holder 41 having teeth 42 at its forward end for moving forward over the two ends 39 of the paper, and tending to pull or stretch the paper inwardly as said holder, which slides on headed studs 43, is pushed forcibly forward by a lever 44 pivoted at 45 to a spider or radial support 46 of the roll, being so moved by a finger or lug 47 projecting from the shaft 48 which carries the roll 19 and driven by a belt pulley or sprocket wheel 49 fast thereon, and a belt or sprocket chain 50, passing over a similar pulley or sprocket wheel 51 on the arbor 52 of the motor 9. To release the sand-paper, the shaft 48 is reversed, thereby allowing the lever or dog 44 to permit the holder 41 to slide backward.

Secured at 53 at the front end of the frame 1 is a strong rigid upright 54, having a cross-handle 55 for pushing the machine forward or backward as desired, and secured in the rectangular casting or yoke piece 28 is an upwardly extending handle 56, provided with a pivoted dog 57 to engage a notch 58 for holding the roll 19 raised, to be released by a pull on a wire 59, as clearly shown in Fig. 2.

In operation, if it is desired to stop the machine momentarily, as necessarily happens frequently without a moment's notice, there is no possible danger of cutting a thin groove or leaving an unevenness in the floor because of the continued rapid rotation of the abrading roll during the halt of the machine, as the operator simply depresses the hand lever 56 the moment he is about to halt the machine, and thereby lifts upwardly the abrading roll from the floor by the lifting movement of the lip 30 against the rear end of the frame 1, which instantly turns the forward end of the frame 2 upwardly to a corresponding extent, thereby removing the abrading roll slightly, but sufficiently, from the floor, where it may be automatically locked by the dog 57. The rear end of the frame 1 simply slides up on the post 23 which maintains the two frames in absolutely true alinement at all times, and yet permits the two frames to work on each other like a pair of scissors, so that the upward movement of the rear end of frame 1 compels the forward end of frame 2 to move upwardly, thereby carrying with it the abrading roll 19. Also, by reason of the triangular support of the machine on the widely separated rolls 11, 11 at the front end of the machine, and the practically single support at the rear end of the machine where the two frames are connected in line with their longitudinal center by the swivel connection 31, the machine is capable of the utmost nicety of adjustment for bringing the abrading roll into absolutely true parallelism with the plane to which it is desired to dress the floor. We have already explained the means for thus adjusting the roll, which resides in the parts 16—21.

Having described our invention, what we claim as new, and desire to secure by Letters Patent, is:

1. A floor-surfacing machine, comprising two frames pivoted centrally together, supporting wheels for one of said frames, an abrading roll horizontally journaled in the other frame in front of the first mentioned frame, and a propelling handle at the rear ends of said frames for momentarily moving them apart to raise said roll from the floor.

2. A floor-surfacing machine, comprising two frames pivoted centrally together, supporting wheels for one of said frames, an abrading roll horizontally journaled in the other frame in front of the first mentioned frame, and a lever movably mounted at the rear end of the machine and of one of said frames and loosely engaging the other frame in position to separate said frames upon proper movement.

3. A floor-surfacing machine, comprising a main supporting frame and a roll-carrying frame horizontally pivoted together, a roll journaled at the front end of the roll-carrying frame, a traveling support located centrally at the rear of said frames, a depending post connecting said traveling support with the rear end of the roll-carrying frame, and a sleeve slidingly mounted on said post and horizontally pivoted to the main frame.

4. A floor-surfacing machine, comprising a main supporting frame and a roll-carrying frame horizontally pivoted together, a roll journaled at the front end of the roll-carrying frame, a traveling support located centrally at the rear of said frames, a depending post connecting said traveling support with the rear end of the roll-carrying frame, a sleeve slidingly mounted on said post and horizontally pivoted to the main frame, and a lever pivotally mounted adjacent said post having a projecting lip for lifting the roll-carrying frame when the lever is turned on its pivot.

5. In a floor-surfacing machine, a main supporting frame and a roll-carrying frame horizontally pivoted together, an abrading roll mounted at the front end of the roll-carrying frame, and a spring for normally holding the front ends of said two frames under tendency to move toward each other for maintaining the roll under proper abrading tension.

6. In a floor-surfacing machine, a main supporting frame and a roll-carrying frame horizontally pivoted together, an abrading roll mounted at the front end of the roll-carrying frame, a spring for normally holding the front ends of said two frames under tendency to move toward each other for maintaining the roll under proper abrading tension, a counter-balance spring arranged in opposition to the other spring, and means for regulating the tension of one of said springs.

7. In a floor-surfacing machine, a main supporting frame, a roll-carrying frame, an abrading roll carried by the latter, said two frames having upwardly extending ears at their opposite sides pivotally connected, the inner frame having peripheral vertical walls forming a central housing, low-down below the pivots, an electric motor mounted low-down in said housing, and a power transmission belt connected with said roll at the front end of the roll-carrying frame and with said motor coaxially of said pivot above said frames.

8. In a floor-surfacing machine, a main supporting frame, a roll-carrying frame pivoted thereto, a horizontal abrading roll extending transversely of the machine, and journal bearing supports for the opposite ends of said roll, said supports being horizontally pivoted in the roll-carrying frame longitudinally of the machine.

9. In a floor-surfacing machine, a main supporting frame, a roll-carrying frame pivoted thereto, a horizontal abrading roll extending transversely of the machine, journal bearing supports for the opposite ends of said roll, said supports being horizontally pivoted in the roll-carrying frame longitudinally of the machine, and means for independently adjusting said journal bearing supports in and out of the frame.

10. In a floor-surfacing machine, a main supporting frame, a roll-carrying frame pivoted thereto, a horizontal abrading roll extending transversely of the machine, journal bearing supports for the opposite ends of said roll, said supports being horizontally pivoted in the roll-carrying frame longitudinally of the machine, and means for independently adjusting said journal bearing supports in and out of the frame, said supports having yoke-shaped outer ends provided with means for vertically adjusting the roll relatively thereto.

11. A floor-surfacing machine, comprising a main supporting frame arranged to roll over the floor, a horizontally extending abrading roll, means for positively rotating the roll, means for momentarily raising the roll at will without stopping its rotation, and means for automatically locking the roll in its raised position.

In testimony whereof, we have signed our names to this specification, in the presence of two subscribing witnesses.

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EDWARD HATHAWAY.

Witnesses:
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M. J. SPALDING.