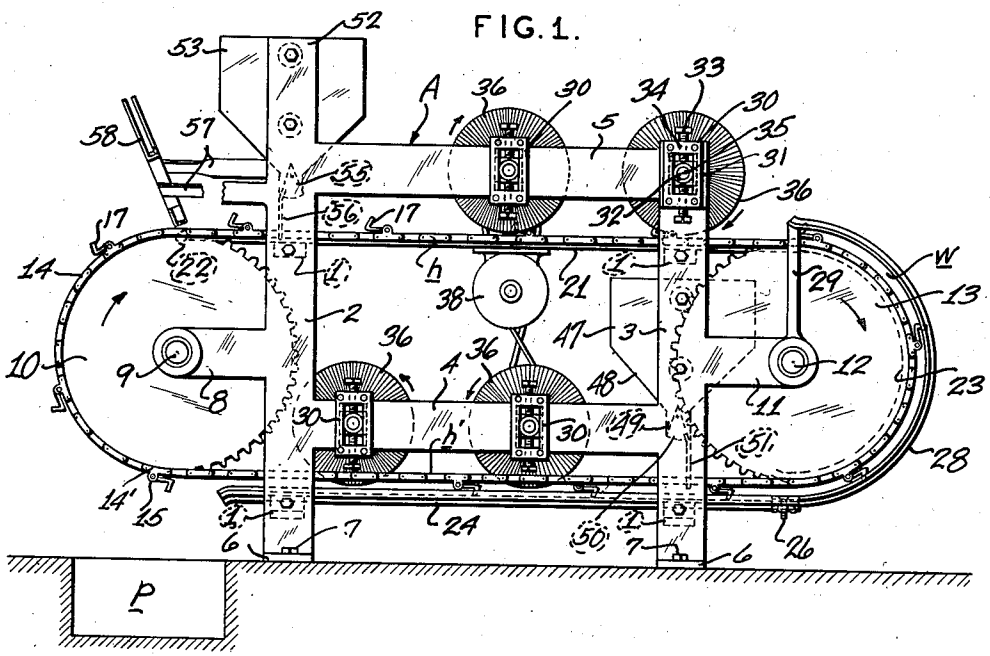
July 29, 1941. H. M. MORRIS 2,250,720

POLISHING MACHINE

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FIG. 1.



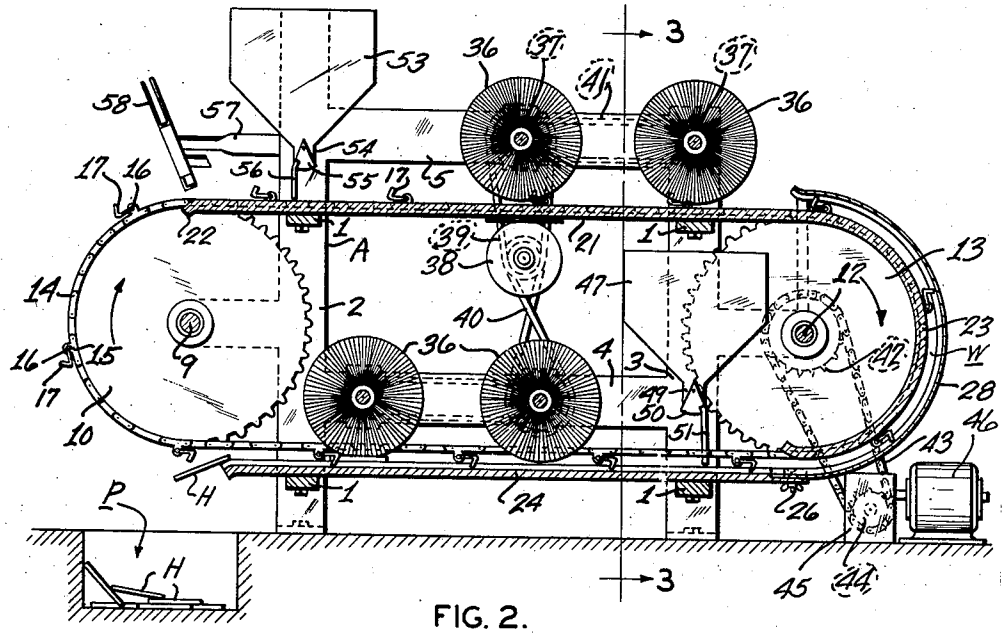


FIG. 2.

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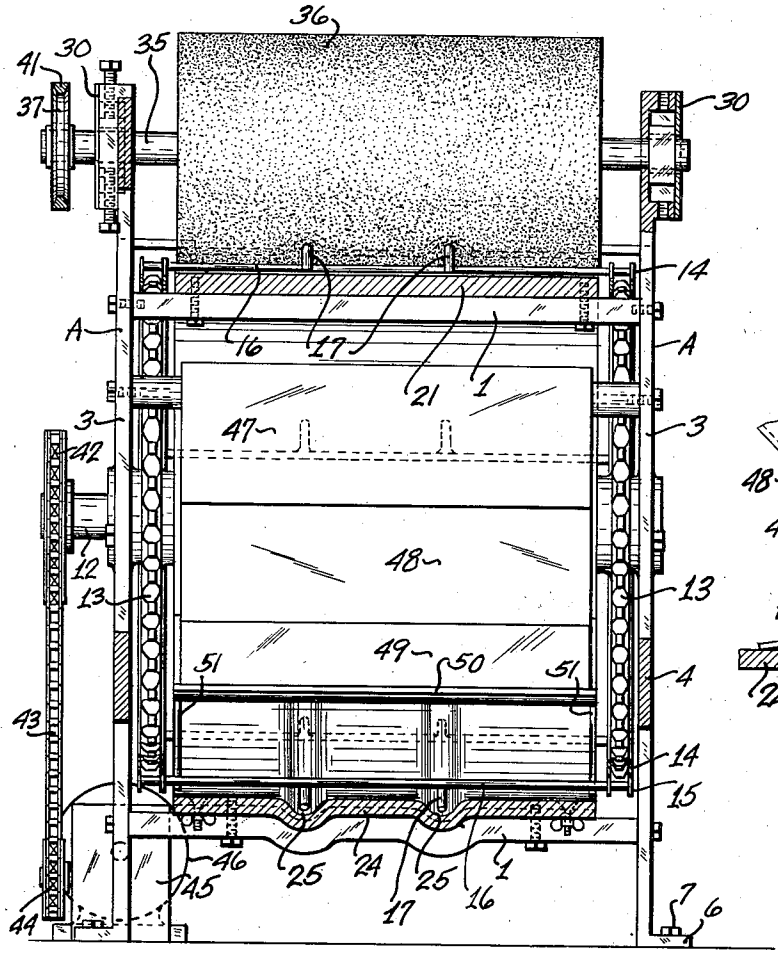


FIG. 3.

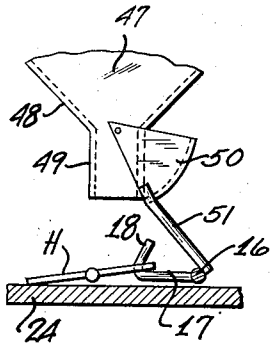


FIG. 4.

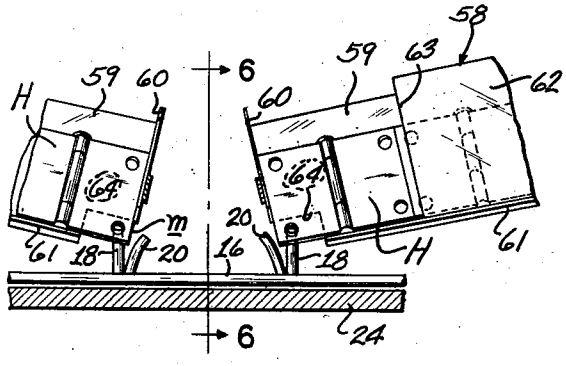


FIG. 5.

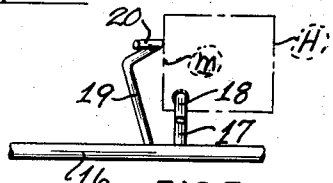


FIG. 7.

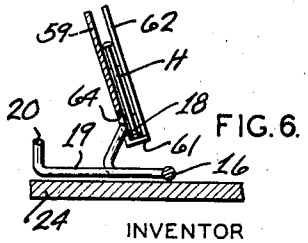


FIG. 6.

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POLISHING MACHINE

Herman M. Morris, St. Louis, Mo.

Application October 23, 1939, Serial No. 300,758

12 Claims. (Cl. 51—74)

This invention relates generally to certain new and useful improvements in polishing or buffing and cleaning machines and has for its primary objects the provision of a machine of the type stated which is simple and economical in construction, which is automatic, speedy, and uniform in operation, which buffs and cleans the work thoroughly and efficiently, and which is highly satisfactory in the performance of its stated functions.

And with the above and other objects in view, my invention resides in the novel features of form, construction, arrangement, and combination of parts presently described and pointed out in the claims.

In the accompanying drawings (2 sheets),—

Figure 1 is a side elevational view of a polishing machine constructed in accordance with and embodying my present invention;

Figure 2 is a longitudinal sectional view of the machine;

Figure 3 is a vertical sectional view of the machine, taken approximately along the line 3—3, Figure 2;

Figure 4 is an enlarged detail view of the abrasive hopper of the machine;

Figure 5 is an enlarged detail view of the work feeder and pick-up of the machine;

Figure 6 is a fragmentary sectional view of the work feeder and pick-up, taken approximately along the line 6—6, Figure 5; and

Figure 7 is a fragmentary plan view of a flight rod and positioning hook of the machine.

Broadly speaking, the machine includes an endless conveyor having spaced horizontal runs and flight rods or other suitable means for picking up and progressing the work-pieces for and during polishing or cleaning. As the work-pieces move along one of the conveyor runs, one face of each thereof is exposed to the cleaning and buffing action of an initial set of suitably mounted brushes or other cleaning or buffing means. During progression from one conveyor run to the other, the work-pieces are inverted or turned upside down, so to speak, automatically, so that during movement along such latter conveyor run, the other or opposite face of the respective work-pieces will be exposed to the cleaning and buffing action of a second set of brushes or other cleaning buffing means. Although a wide variety of work-pieces may be accommodated in the present cleaning and buffing machine, for purposes of illustration and by way of example, the present machine is shown and will be described in connection with the cleaning and buffing of plate-hinges.

Referring now in more detail and by reference characters to the drawings, which illustrate a preferred embodiment of my invention, the present machine includes a pair of companion side frames A rigidly secured together in transversely spaced parallel relation by suitable upper and lower sets of cross-beams 1 and each having a pair of longitudinally aligned upright legs 2, 3, preferably integrally connected by upper and lower longitudinally disposed strips 4, 5. At their lower extremity, the legs 2, 3, are provided with outwardly projecting suitably apertured flanges or feet 6 for securement to a floor or other place of support F by means of conventional lag bolts or the like 7.

The frames A are provided preferably integrally with rearwardly projecting transversely registering arms 8, disposed between and suitably journaled upon which is a shaft 9 having keyed thereon a pair of transversely spaced sprocket-wheels 10.

The frames A are similarly provided with forwardly projecting transversely registering arms 11, disposed between and journaled upon which with its axis parallel to and in the same horizontal plane as the axis of the shaft 9, is a shaft 12 provided with a pair of sprocket wheels 13 respectively positioned in peripheral alignment with the sprocket wheels 10.

Trained over the sprocket wheels 10, 13, are endless conveyor chains 14 having upper and lower horizontal runs *h*, *h'*, respectively, and provided at spaced intervals with link side plates 14' having projecting lugs 15. Rigidly mounted at their ends in, and extending transversely of the machine between opposed pairs of, the side plate lugs 15, are horizontally disposed flight-rods 16, suitably mounted on which and disposed longitudinally of the machine is a series of suitably spaced hooks 17 each having a bill 18 presented forwardly of the machine. Also fixed on, and presented rearwardly of the machine from, each of the respective flight rods 16 adjacent the particular hook 17, is an obliquely bent positioning prong 19 extending a substantial distance rearwardly of the machine beyond the hook 17 and provided with an upwardly and outwardly bent arcuate finger 20, all as best seen in Figures 5, 6, and 7 and for purposes presently fully appearing.

Suitably fixed upon the upper cross-beams 1 with its upwardly presented face disposed slightly below the plane of the upper conveyor chain

run *h*, is a slide-table or upper bed 21 provided at its one or rear end with a short downwardly curved lip 22 positioned substantially over the shaft 9, and at its other or forward end with an arcuate continuation 23 spaced outwardly from and concentric with the shaft 12.

Similarly mounted upon the lower cross-beams 1 and extending horizontally beneath, and spaced downwardly a short distance from, the lower horizontal conveyor run *h'*, is a second slide plate or lower bed 24 provided in its upper face with a plurality of longitudinally extending channels or ways 25 for accommodating the projecting ends of the hook-bills 18 and positioning-fingers 20.

Having preferably an adjustable slot-and-pin connection, as at 26, with the forward transverse end margin, and forming substantially a continuation of, the slide plate 24, is a suitably arcuate plate or wall 28, which extends forwardly and upwardly in spaced concentric relation to the sprockets 13 and table continuation 23, the wall 28 being at its upper end suitably supported by bracket arms 29 upstanding from the journal arms 11 and providing with the continuation 23 a work-piece way, as at *w*, all as best seen in Figures 1 and 2.

Formed in or mounted upon each of the strips 4, 5, are pairs of longitudinally spaced transversely aligned adjustable bearing members 30 each including an open rectangular slide-frame 31 for shiftably accommodating a journal block 32 adjustably held between opposed screws 33 threaded in the end-members 34 of the frame 31. Journaled in, and extending transversely of the machine between, the respective sets of aligned adjustable bearings 30, are shafts 35 each provided intermediate its ends with suitable buffing brushes 36.

The respective shafts 35 project at one end outwardly through the journal blocks 32 and are suitably provided with pulley wheels 37 drivingly interconnected and to a suitable prime-mover, such as a conventional high-speed electric motor 38, by means of suitable belts or the like 39, 40, 41, the motor 38 being preferably suitably secured upon the under face of the upper slide table 21, all as best seen in Figure 2.

Similarly, the shaft 12 projects at an end outwardly beyond a side face of one of the journal arms 11 and is provided with a sprocket 42 for connection by means of a sprocket chain 43 to the driven sprocket 44 of a conventional reduction gear box 45, in turn, drivingly connected to a conventional electric motor 46, as best seen in Figures 2 and 3.

Suitably fixed upon, and disposed intermediate, the front frame-legs 3, is a conventional preferably sheet-metal open-top hopper 47 having opposed downwardly inclined bottom wall portions 48 terminating in a reduced slot-like discharge spout or chute 49 normally closed by a free-swinging arcuate cut-off door 50 pivotally mounted upon the chute side walls and provided with a downwardly extending trip-rod 51 projecting at its lower end into the path of the flight-rods 16 as the same move along the lower conveyor run *h'*, all as best seen in Figures 1 and 2 and for purposes presently fully appearing.

Similarly mounted upon and disposed between arms 52 extending upwardly from the rear frame-legs 2, is a second hopper 53 substantially identical in all respects with the hopper 47 and likewise provided with a discharge chute 54 having a cut-off door 55, in turn, provided with a downwardly extending trip rod 56 projecting at its lower end into the path of the flight-rods 16 as the same move along the upper horizontal conveyor run *h*, also as best seen in Figures 1 and 2 and for purposes presently fully appearing.

Forming part of, and extending rearwardly from, the frames A, is a pair of arms 57 supporting at their outer extremity obliquely disposed chutes 58 each including a back wall 59 bent upwardly at its inner transverse end in the provision of a stop flange 60. Preferably integrally connected to the chute back wall 59 by means of a narrow intervening bottom wall 61, is a front wall 62 somewhat shorter than the back wall 59 and accordingly having its inner margin 63 spaced outwardly from the stop flange 60 by a distance somewhat greater than the length of a single work-piece, that is to say, in the present instance, a hinge-plate H. The chute back wall 59 is also cut away at its lower inner corner in the provision of a take-off recess 64, all as best seen in Figures 5 and 6 and for purposes presently fully appearing.

In use and operation, the motors 41, 46, are suitably energized and set in motion, thereby rotatively driving the buffing brushes 36 and the sprockets 10, 13, and effecting travel of the conveyor-chains 14 and associated flight-rods 16 in the sequential directions indicated by the arrows in Figure 1. At the same time, the feed chutes 58 are suitably filled with hinges or other work-pieces H, which successively move downwardly into the position shown in Figure 5.

As a respective flight-rod 16 moves forwardly, its carried hook-bill 18 passes through the take-off recess 64 of the chute back wall 59 and engages the presented work-piece H at an exposed screw-aperture. On subsequent forward movement of the flight-rod 16, the engaged hinge or work-piece H is pulled from the particular chute 58, whereupon such hinge H takes a substantially flatwise position upon the upper face of the table 21, the inwardly presented longitudinal margin *m* of such hinge H, in such movement, riding against the finger of the positioning prong 19 and shifting such hinge H to a so-called "square" position with respect to the flight rod 16, as shown in dotted lines in Figure 7. It may here be observed that, during its subsequent travel, such positioning prong 19 functions to maintain the hinge H in such stated position, so that the flat surface of the hinge H will be uniformly exposed to the polishing action of the respective buffing brushes 36.

During the course of further travel, the particular flight-rod 16 passes beneath the hopper 53 and, by tripping the trip-rod 56, as shown in Figure 4, causes a quantity of suitable abrasive or polishing powder to be deposited upon the traveling hinge H. Thereupon, the hinges H are carried in successive order beneath the buffing brushes 36 and through the arcuate way *w* into the lower conveyor run *h'* for travel along the lower slide plate 24, during which latter travel that face of the hinge H, which previously was in contact with the upper slide table 21 and hence unpolished, now passes beneath the hopper 47 and in like manner is covered with a quantity of abrasive or polishing powder and is then passed beneath the successive buffing brushes 36, the successive hinges H, following the polishing, buffing, or cleaning action of the several brushes 36, passing over the end margin of the lower slide plate 24 and dropping freely off of the hooks

17 into a suitably provided catch pit or the like p, as best seen in Figure 2.

Through the adjustability of the wall 28, the dimensions of the way w may be enlarged or reduced to more or less snugly accommodate the particular work-pieces H so as to retain the same upon the hooks 17 as they travel from the upper to the lower conveyor run. The machine is relatively simple structurally, is substantially wholly automatic and labor and time saving, and is exceedingly efficient in the performance of its intended functions.

It should be understood that changes and modifications in the form, construction, arrangement, and combination of the several parts of the machine may be made and substituted for those herein shown and described without departing from the nature and principle of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is,—

1. A machine for polishing selected work-pieces comprising polishing means, conveyor means for progressing the work-pieces successively beneath the polishing means, and means associated with said polishing means and actuated by the conveyor means for depositing polishing material upon the traveling work-pieces.

2. A polishing machine comprising first and second polishing members disposed in spaced planes one elevated above the other, conveyor means having upper and lower runs for progressing work-pieces successively beneath the said polishing members, the first member being located over the upper conveyor run and the second member being located intermediate said runs, and means associated with said polishing members and actuated by the conveyor means for depositing polishing material upon the traveling work-pieces.

3. A machine for polishing the opposite flat faces of selected work-pieces comprising upper and lower polishing means, conveyor means for progressing the work-pieces successively beneath the several polishing means and inverting the work-pieces during the course of travel between the polishing means, and means associated with each of said polishing means and actuated by the conveyor means for depositing polishing material upon the traveling work-pieces.

4. A polishing machine comprising first and second polishing means disposed in spaced planes one elevated over the other, and conveyor means including an arcuate way for progressing work-pieces successively beneath the first polishing means, then through said way for inverting the work-pieces, and then beneath the second polishing means.

5. A machine for polishing the opposite flat faces of selected work-pieces comprising first and second flat tables disposed in spaced relation one above the other, said tables having way-forming curved end continuations disposed in spaced concentric relation to each other, and conveyor means for progressing the work-pieces successively across the first table between the end continuations and then across the second table.

6. A machine for polishing the opposite flat faces of selected work-pieces comprising upper and lower tables, first and second polishing means respectively positioned above said upper and lower tables, conveyor means for progressing the work-pieces along a path having upper and lower straight sections respectively disposed over said tables and connected by an arcuate section and thereby moving the work-pieces successively beneath the first polishing means for polishing one face of the work-pieces, inverting the work-pieces during the course of travel along the arcuate path-section, and then finally progressing the work-pieces under the second polishing means for polishing the opposite face of the work-pieces, and means for feeding work-pieces to the conveyor means.

7. A machine for polishing the opposite flat faces of selected work-pieces comprising upper and lower flat tables having curved way-forming end continuations disposed in spaced concentric relation to each other, upper and lower polishing means respectively positioned adjacent the upper and lower tables, and conveyor means including a plurality of spaced parallel flight-rods for progressing the work-pieces successively across the upper table, between the end continuations, and then across the lower table, some of said rods being provided with a plurality of hook-members for engaging the work-pieces.

8. A machine for polishing the opposite flat faces of selected work-pieces comprising upper and lower flat tables having curved way-forming end continuations disposed in spaced concentric relation to each other, upper and lower polishing means respectively positioned adjacent the upper and lower tables, and conveyor means including a plurality of spaced parallel flight-rods for progressing the work-pieces successively across the upper table, between the end continuations, and then across the lower table, some of said rods being provided with a plurality of hooks for gripping the work-pieces and said lower table and its associated end continuation being provided with longitudinal clearance grooves positioned and sized for accommodating said hooks.

9. A polishing and buffing machine including upper and lower horizontal tables having curved way-forming continuations disposed in spaced concentric relation to each other, first buffing means operatively mounted adjacent the upper table, second buffing means operatively mounted adjacent the lower table, and means including a plurality of flight-rods provided with hooks for gripping and progressing the work to be polished across the upper table while exposing one face to the first buffing means and then across the lower bed while exposing a different face to the second buffing means.

10. A polishing machine including upper and lower horizontal tables disposed in planes one above the other, a first rotary brush operatively mounted adjacent the upper table, a second rotary brush operatively mounted adjacent the lower table, conveyor means including a plurality of flight rods having hooks for gripping and progressing the work to be polished first across the upper table and engagingly under the first brush, then in an arcuate path for inverting the work, and then across the lower bed and engagingly under the second brush, and means for rotarily actuating the brushes.

11. A polishing machine including frame-members in spaced parallel relation, first and second tables on the frame-members in spaced relation one elevated over the other, an arcuate way on the frame-members extending from the upper to the lower table, first rotary brushes operatively mounted on the frame-members adjacent the upper table, second rotary brushes operatively mounted on the frame-members adjacent the lower table, conveyor means including a plural-

ity of flight-rods having hooks for gripping the work for progressing the same over said tables and through said way for engagement by the respective brushes, and means for rotarily actuating the several brushes.

12. A machine for polishing the opposite flat faces of selected work-pieces comprising upper and lower flat tables having curved end continuations disposed in spaced concentric relation to each other, and conveyor means including a plurality of spaced parallel flight rods for progressing the work-pieces successively across the upper table between the end continuations and then across the lower table, each of said rods being provided with a plurality of upstanding hooks for gripping the work-pieces, said lower table and its associated end continuation being provided with grooves positioned and sized for accommodating the ends of the hooks for holding the work-pieces in engaged relation with the hooks during travel across the lower table.

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