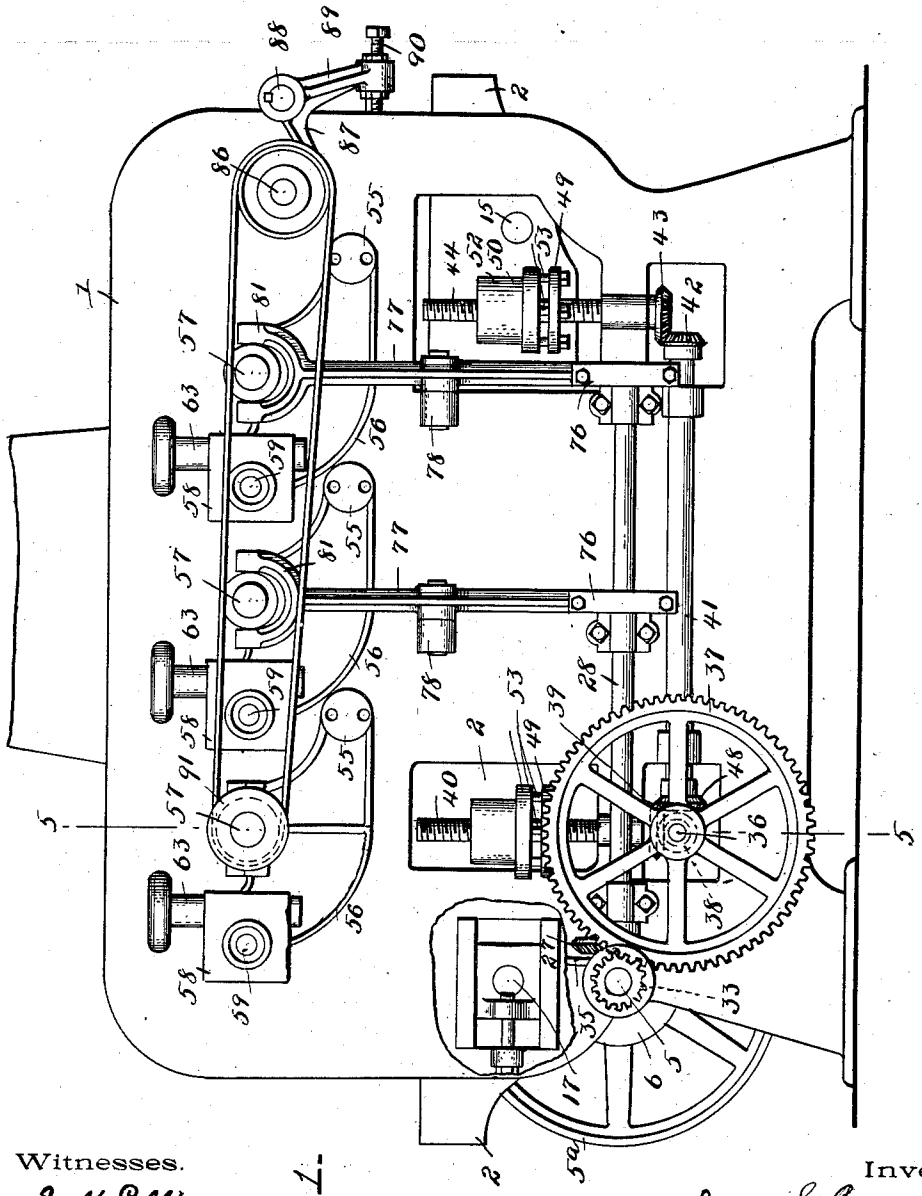
No. 657,357. Patented Sept. 4, 1900.

J. L. PERRY.

SANDPAPERING MACHINE.

(Application filed Nov. 27, 1899. Renewed July 31, 1900.)

(No Model.) 8 Sheets—Sheet 1.



Witnesses.
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Fig. 1.

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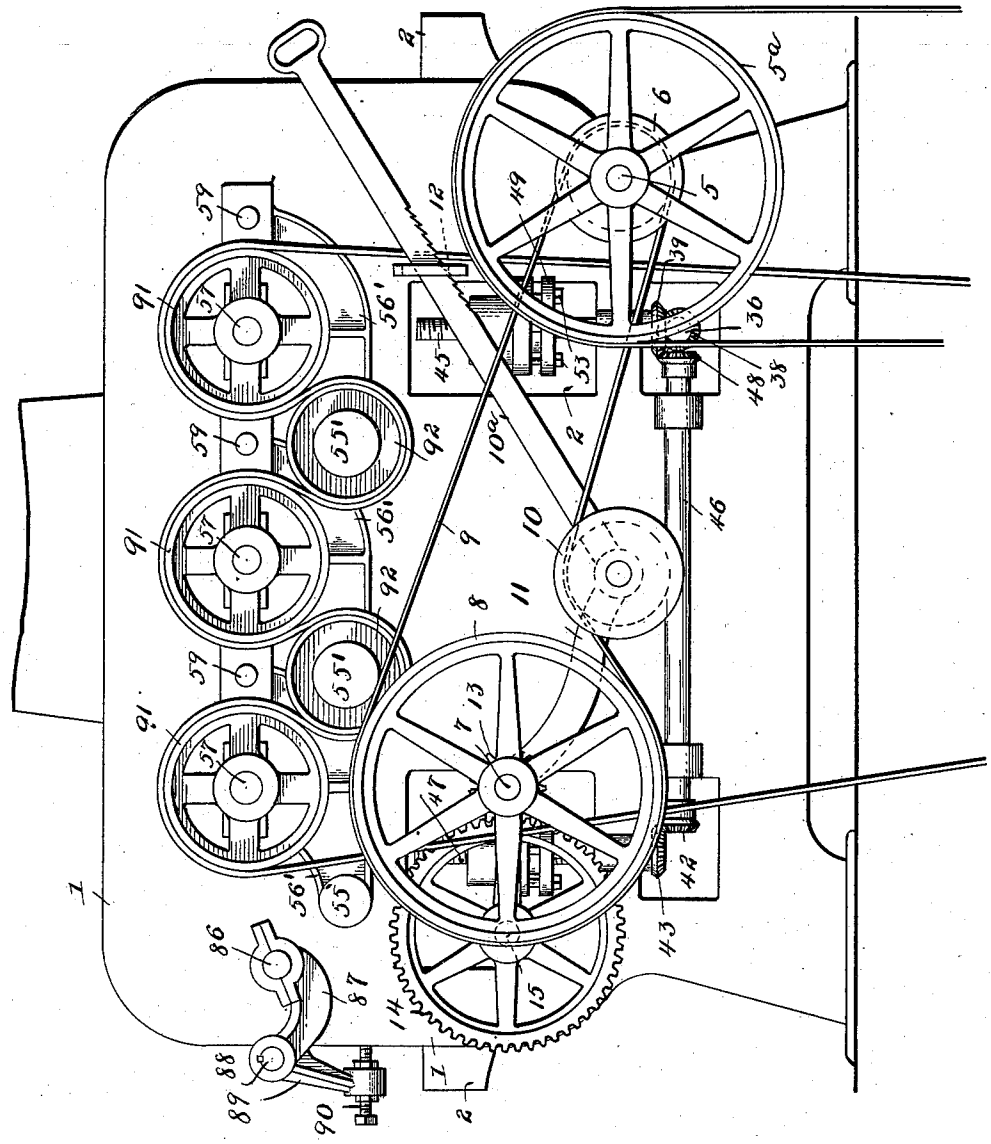
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Witnesses.

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FIG. 2.

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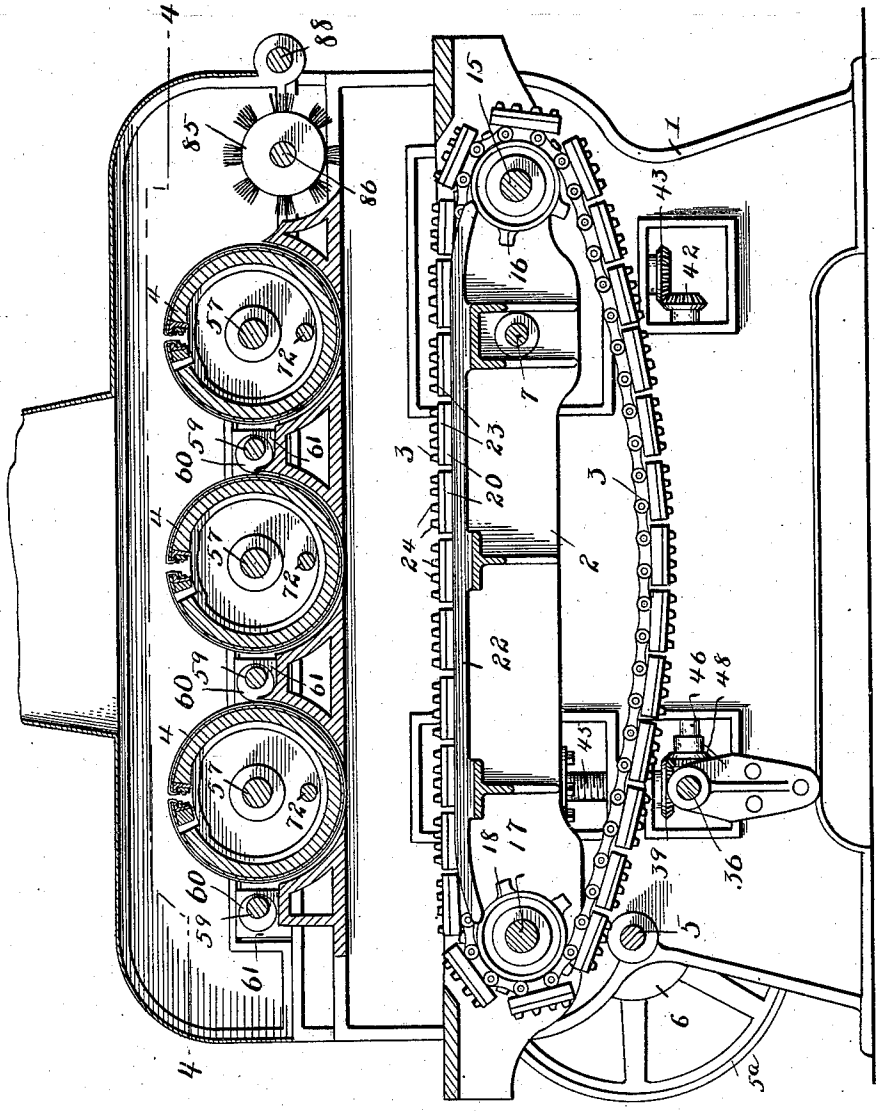
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SANDPAPERING MACHINE.

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(No Model.) 8 Sheets—Sheet 3.



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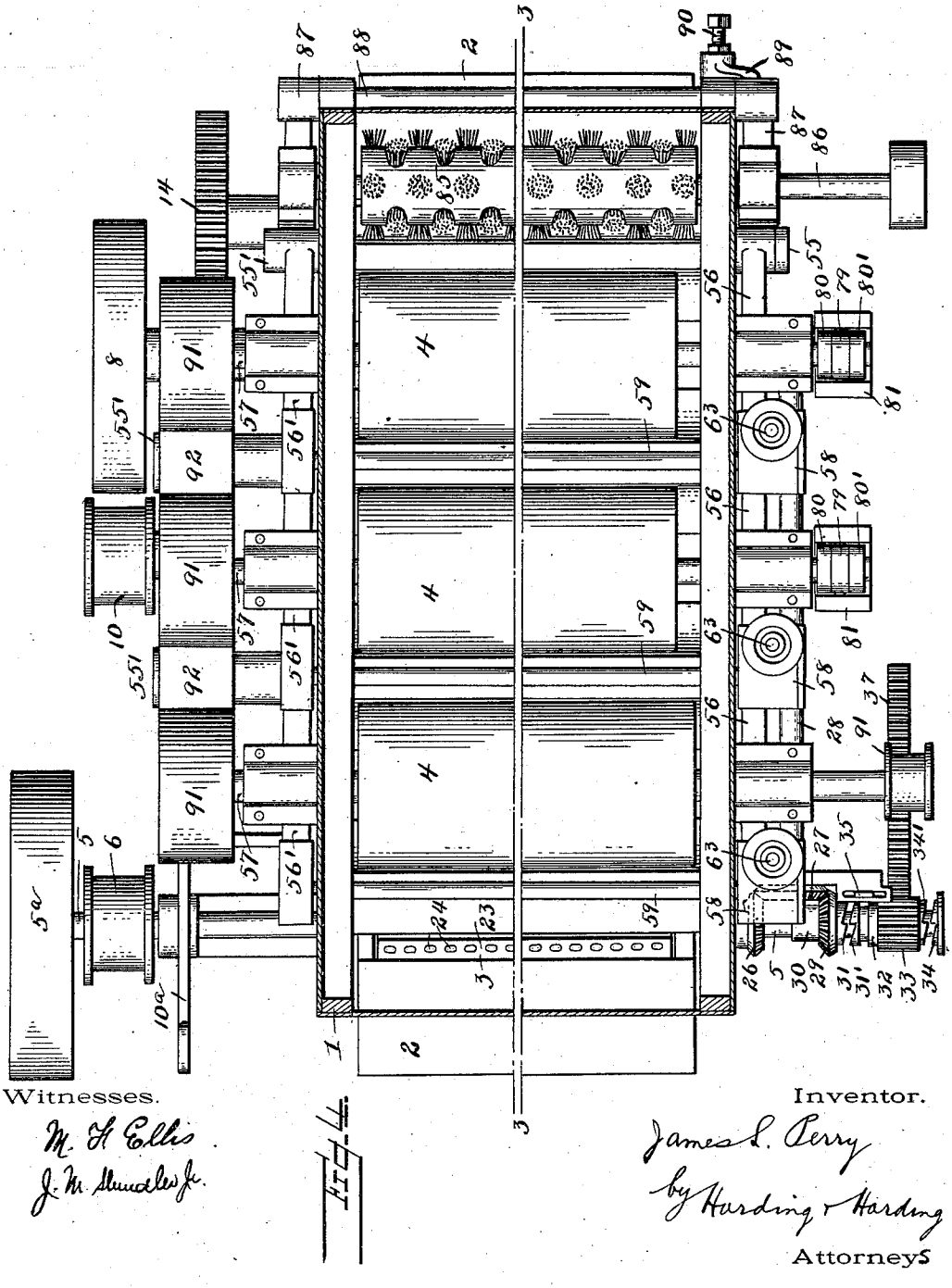
No. 657,357. Patented Sept. 4, 1900.

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(Application filed Nov. 27, 1899. Renewed July 31, 1900.)

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Fig. 15.

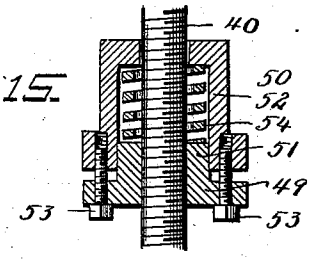


Fig. 5.

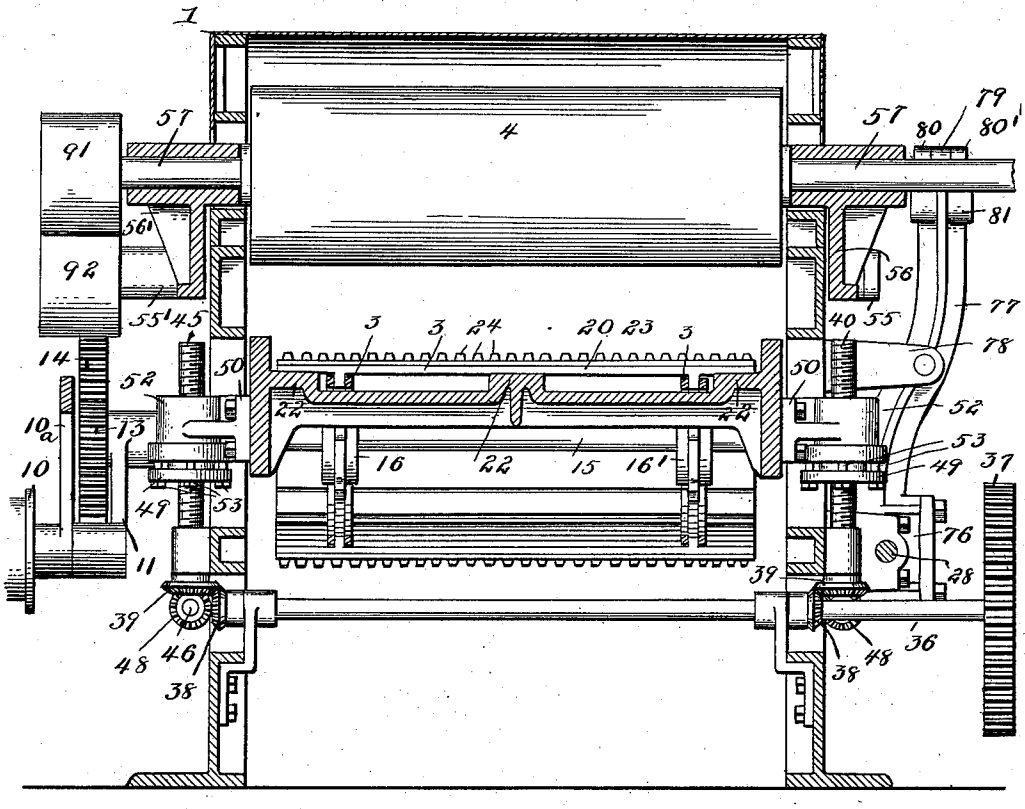
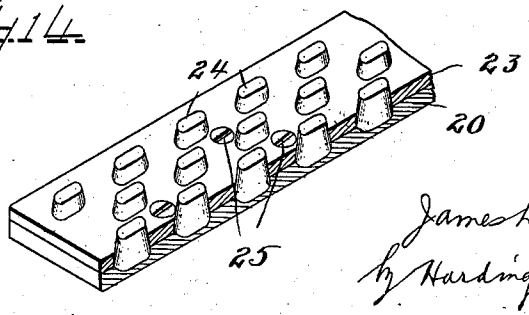


Fig. 14.



Witnesses.

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Fig. 6.

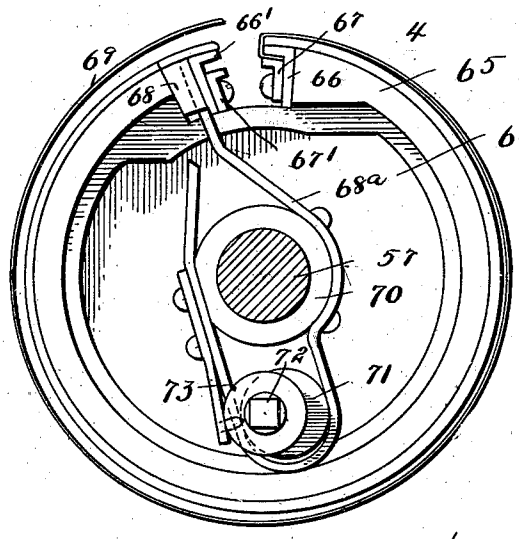


Fig. 6a.

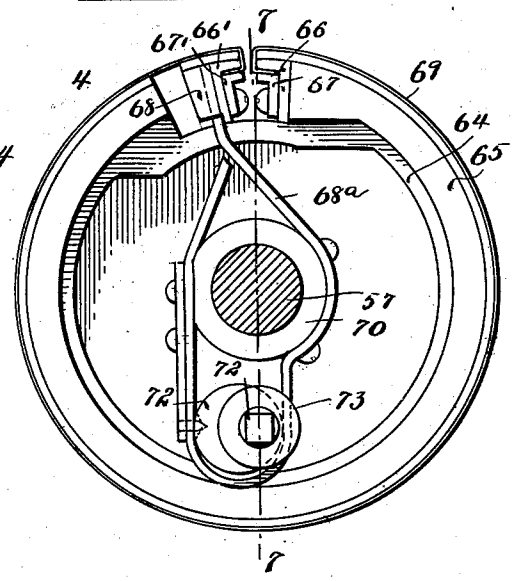
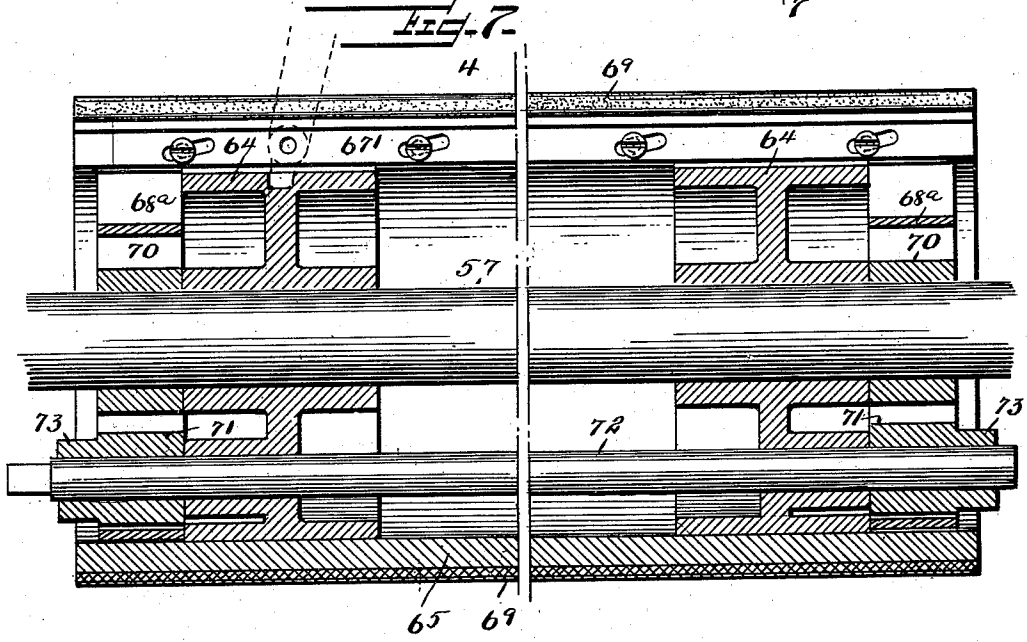


Fig. 7.



Witnesses.

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(Application filed Nov. 27, 1899. Renewed July 31, 1900.)

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Fig. 10.

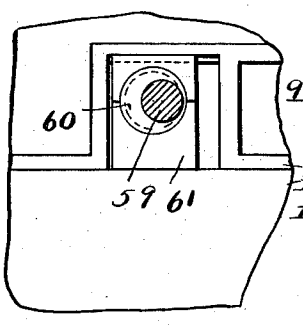
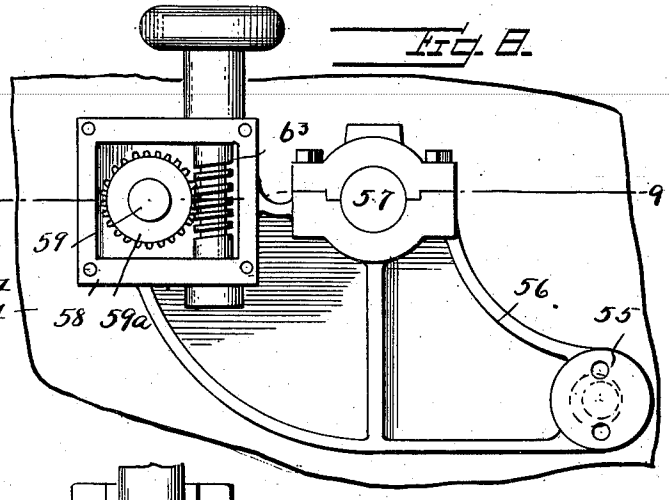


Fig. 8.



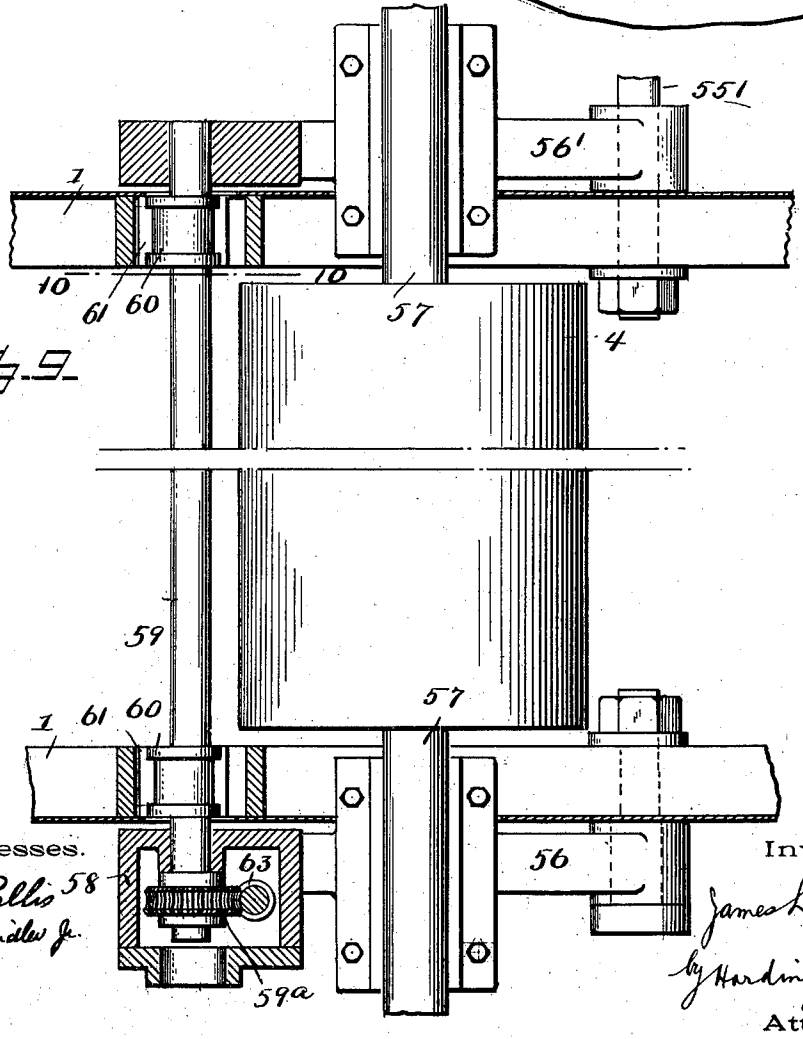


Fig. 9.

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Fig. 11.

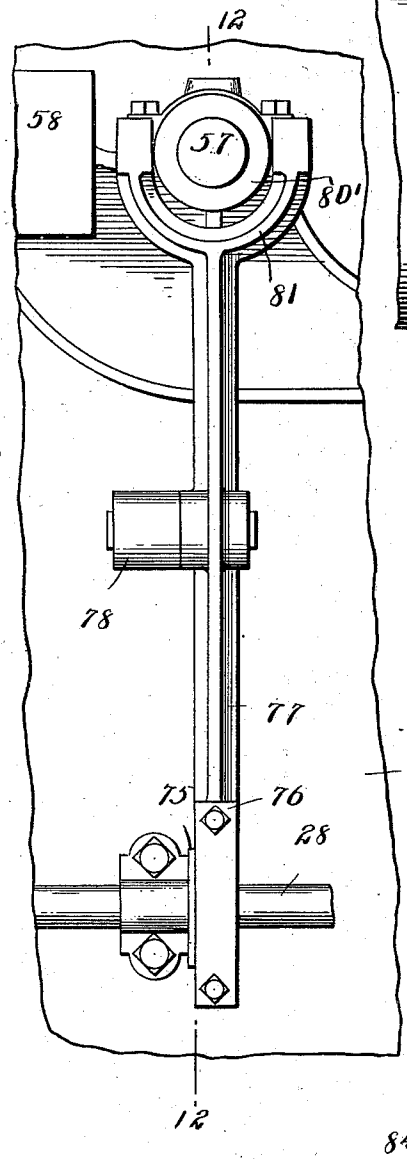


Fig. 12.

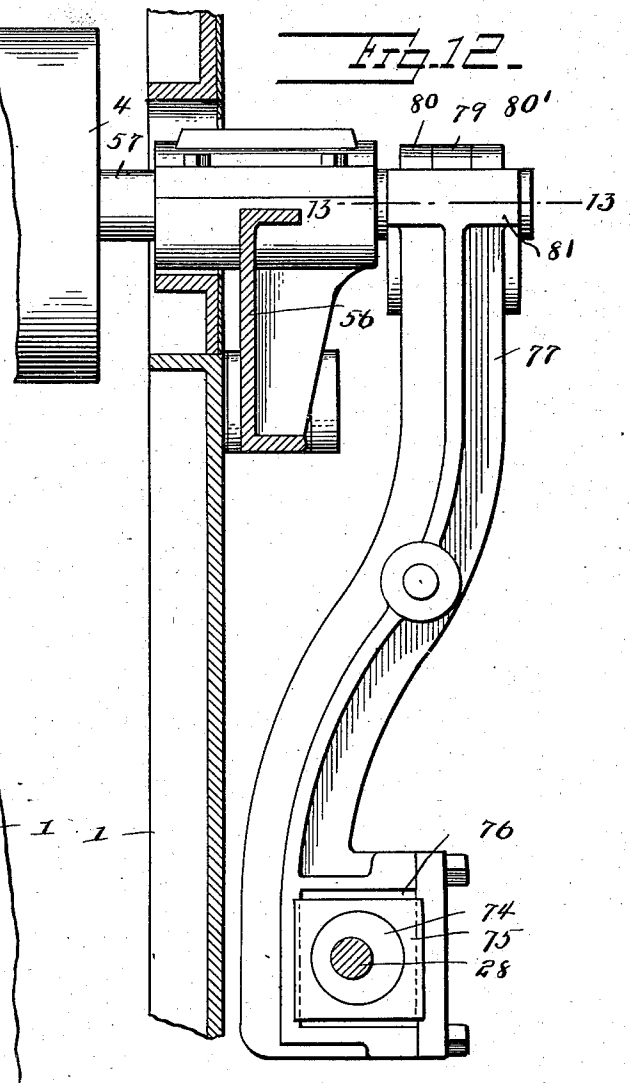
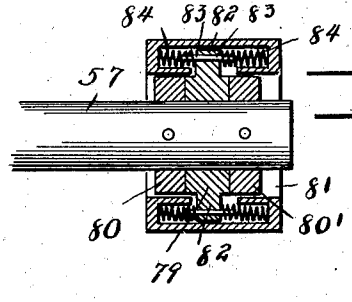


Fig. 13.



Witnesses.

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UNITED STATES PATENT OFFICE.

JAMES L. PERRY, OF SMITHVILLE, NEW JERSEY, ASSIGNOR TO THE H. B. SMITH MACHINE COMPANY, OF SAME PLACE.

SANDPAPERING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 657,357, dated September 4, 1900.

Application filed November 27, 1899. Renewed July 31, 1900. Serial No. 25,457. (No model.)

To all whom it may concern:

Be it known that I, JAMES L. PERRY, a citizen of the United States, residing at Smithville, county of Burlington, and State of New Jersey, have invented a new and useful Improvement in Sandpapering-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to sandpapering-machines, and has for its object to so construct the machine as to give a smooth finish to the work; to provide an improved yielding feeding device; to provide for varying the adjustment at different points of the support for the work and of the several sanding devices; to secure a uniformity of level of the support for the work and of the sanding devices, so as to insure a uniform finish to the work; to provide for removing and replacing the sandpaper expeditiously, and to perfect the operation of the entire machine.

My invention consists of an endless conveyer traveling under the sanding-drums and adapted to feed the work forward and provided with yielding cushions upon which the work is laid and against which it is pressed during the feeding.

It consists also of means for raising and lowering independently the several corners of the support for the conveyer and for leveling the support as a whole.

It consists also of means for imparting to the drums a vibrating or side-to-side motion during the rotation of the drums and feeding forward of the work.

It consists also of means for adjusting independently the ends of each drum and leveling each drum as a whole.

It consists also of various details of construction, all of which will be hereinafter fully described.

In the drawings, Figure 1 is a side elevation; Fig. 2, a similar view from the other side; Fig. 3, a section on the line 3 3 of Fig. 4; Fig. 4, a sectional plan on the line 4 4 of Fig. 3; Fig. 5, a section on the line 5 5 of Fig. 1. Figs. 6 and 6ª are side elevations of the sandpaper-drum. Fig. 7 is a section on the line 7 7 of Fig. 6ª. Fig. 8 is an enlarged detail, in side elevation, of the elevating and leveling mechanism for the sandpaper-drum. Fig. 9 is a section on the line 9 9 of Fig. 8. Fig. 10 is a section on the line 10 10 of Fig. 9. Fig. 11 is a side elevation of the vibrating mechanism for the sandpaper-drum. Fig. 12 is a section on the line 12 12 of Fig. 11. Fig. 13 is a section on the line 13 13 of Fig. 12. Fig. 14 is a detail section through a portion of the conveyer, and Fig. 15 is a sectional view through one of the table-leveling nuts and screws.

1 is the machine-frame; 2, the vertically-adjustable carrier-supporting table; 3, the endless carrier, and 4 the sanding-drums.

5 is the main driving-shaft, having the driving-pulley 5ª and the pulley 6.

7 is a shaft having the pulley 8.

9 is a belt between pulleys 6 and 8.

10 is an idle pulley engaging belt 9. Pulley 10 is journaled in arm 11, pivoted on shaft 7.

10ª is a lever pivoted on shaft of pulley 10 and has teeth engaging a dog 12 on the frame. By adjusting lever 10ª the tension of belt 9 is regulated.

13 is a pinion on shaft 7. This pinion engages a gear 14 on shaft 15. This shaft has the two sprocket-wheels 16 16′. On the opposite end of the machine is a shaft 17, having the two sprocket-wheels 18 18′. (See Fig. 3.) Extending around sprocket-wheels 16 and 18 and 16′ and 18′, respectively, are two sprocket-chains 19. Secured to alternate links of the chains are the sections 20 of the carrier 3. The chains travel over tracks 22 on each side of the table and the carrier rests directly upon and travels over the track 22 along the longitudinal center of the table.

The particular construction of the carrier is as follows: Each section 20 has secured to its outside face a perforated plate 23. The perforations are conical in shape (see Fig. 14) and contain the conical-shaped rubber cushions 24, which are inserted through the back of the plate before its attachment to the carrier-section. The attachment of the plates to the sections is by means of screws 25 or otherwise. By these means the carrier is rendered yielding, which is an obvious advantage, as it enables a considerable pressure to be exerted upon the work by the sanding-

drums without danger of indenting or affecting the smoothness of the work during the sandpapering operation, increases the traction, so as to insure the work being carried along with the carrier, and compensates for any absence of strict exactitude in the adjustment of the carrier and the drums. The cushions are preferably arranged in a staggered fashion, and the screws inserted between the cushions, as shown in Fig. 14.

I will now describe the mechanism for raising and lowering the table 2, so as to provide for operating upon different thicknesses of material. (See Fig. 1.)

26 is a bevel-gear on the driving-shaft 5. Meshing with bevel-gear 26 is bevel-gear 27 on shaft 28. Bevel-gear 27 meshes with bevel-gear 29 on sleeve 30, which is loose on the driving-shaft 5. The sleeve 30 has the clutch member 31. 32 is another sleeve loose on the driving-shaft 5. This sleeve has the pinion 33 and the clutch members 21′ and 34′.

34 is a clutch member on the driving-shaft 5.

35 is a lever pivoted on the frame of the machine and by means of which sleeve 32 may be moved to throw into engagement either clutch members 31 and 31′ or 34 and 34′. In the former case pinion 33 will revolve in a direction opposite to that of the shaft. In the latter case the pinion 33 will revolve in the same direction as the shaft.

36 is a shaft carrying the gear 37, meshing with pinion 33. On the transverse shaft 36 is a bevel-gear 38, meshing with bevel-gear 39 on the upright shaft 40. The last-named bevel-gear also meshes with a bevel-gear 48 on the horizontal shaft 41, which has a bevel-gear 42, meshing with bevel-gear 43 on upright shaft 44. At the other end of shaft 36 is a similar arrangement of bevel-gears for driving a third upright shaft 45 and a second horizontal shaft 46 on the other side of the machine, which in turn is connected with a fourth upright shaft 47 in the same manner as shaft 41 is connected with shaft 44. By engaging sleeves 30 and 32 the upright shafts 40, 44, 45, and 47 are all simultaneously revolved in one direction, and by engaging sleeve 32 and clutch member 34 these shafts are all simultaneously revolved in the opposite direction. These shafts are screw-threaded at their upper ends (see Fig. 5) and each engages a nut 49, connected to a lug 50, secured to one corner of the table. The engagement of sleeves 30 and 32 will revolve the upright shafts, so as to raise the table, while the engagement of sleeve 32 and clutch member 34 will lower the table.

To provide for leveling the table—that is, adjusting each of the four corners independently, so as to remedy any failure of the raising-and-lowering mechanism to move the four corners to precisely the same height—I provide the following construction, (see Figs. 5 and 15:) On the nut 49 is a projection 51. The lug 50 consists of a box 52, into which projection 51 extends. 53 shows bolts extending loosely through nut 49 and engaging box 52. A coil-spring 54 lies between the top of the box and the projection 51. The screw-shaft (say) 40 engages the nut 49 and extends within the spring 54 and through a plain orifice in the top of box 52. By loosening the bolts 53 spring 54 raises box 52 and the corresponding corner of the table. By tightening bolts 53 box 52 and the corresponding corner of the table are lowered.

I will now proceed to describe the method of supporting, raising or lowering, and leveling the sanding-drums. (See Figs. 8, 9, and 10.)

55 55′ are pins on opposite sides of the frame, there being a pair for each drum. On these pins are pivoted the arms 56 and 56′, respectively. Intermediate of these ends of the arms are bearings from the drum-shaft 57 of one of the drums 4. The outer end of one of the arms forms the journal for one end of a shaft 59, while the outer end of the other arm has the box 58, in which the outer end of the shaft 59 is journaled. This shaft has near each end an eccentric 60, which engages a block 61. The block 61 rests upon the frame of the machine and in guides 62 on the frame of the machine, which permit the block to move horizontally. On the end of the shaft 59 which projects into the box 58 is a worm-wheel 59^a, and extending through the box 58 and engaging the worm-wheel is the worm 63. In order to raise or lower any one drum, the worm 63 is turned, which turns the shaft 59. By reason of the eccentric bearing of the shaft in block 61 and the capacity of the block to move laterally but not vertically the shaft 59 is either raised or lowered. The pins 55 55′ are eccentrically shaped, and when, for example, pin 55 is turned by hand the end of the drum supported by arm 56 is raised or lowered relatively to the other end. In adjusting any drum the pins are turned until the two ends of the drum are on a level, after which the worm is operated to raise or lower the entire drum to regulate the depth of the cut. The drums are raised and lowered and leveled independently of each other.

The particular construction of the drum will now be described. (See Figs. 6, 6^a, and 7.)

64 represents hubs on the drum-shaft, and 65 the periphery of the drum.

66 is an angle-iron secured to the periphery at one side of the cut-away portion. 66′ is another angle-iron secured to a block 68, located within and toward the other side of the cut-away portion.

67 67′ are angle-irons secured to the angle-irons 66 66′, respectively, by means of bolts extending through slots in angle-irons 67 67′ and entering angle-irons 66 66′.

The sandpaper 69 extends around the drum-periphery. To fasten it on the drum, one end is placed between angle-irons 66 and 67, and by means of a wrench or other suitable tool the angle-iron 67 is moved laterally, which causes it, by reason of its slot-and-bolt con-

nection with angle-iron 66, to also move toward the periphery, firmly securing that end of the sandpaper to the drum. The other end of the sandpaper is similarly secured between angle-irons 66′ and 67′.

The block 68 is yieldingly supported by being fastened at each end to one end of a spring or tension device 68ª. Each spring is secured to a collar 70 on the drum-shaft, extends down around an eccentric 71, (on a shaft 72, having its bearings in the hubs of the drum,) and thence up and secured to the opposite side of collar 70. It is obvious that by rotating the shaft 72 and eccentric 71 from the position shown in Fig. 6 to that shown in Fig. 6ª the spring or yielding support 68ª and block 68 will be drawn into the position shown in Fig. 6ª, thereby drawing the sandpaper tightly around the drum.

73 is a collar fastened on each end of the shaft 72. Each spring is thus between one of these collars and the hub, and will thereby be prevented from springing laterally. Any shrinkage of the sandpaper will increase the tension of the spring. Any stretching of the sandpaper will be taken up by the spring.

The following means are provided for giving to the drums during rotation a constant vibratory movement in the direction of their length, thereby compensating for any slight inequalities of the sandpaper and perfecting the finish of the work; on the shaft 28, which, as before described, is constantly rotated, is an eccentric 74. (See Figs. 11, 12, and 13.) This eccentric enters an orifice in a block 75, which is guided in a box 76, so as to be capable of a vertical movement therein. 77 is a lever or vibrator intermediately pivoted on a horizontal axis to a lug 78 on the frame of the machine and fastened at its lower end to the box 76. It will readily be understood that as the shaft 28 rotates the block 75 will move up and down in the box 76, while the box 76 will be moved laterally, thereby vibrating the lever. On the end of one of the drum-shafts are three collars, the central one of which, 79, is loose on the shaft, while the outer ones 80 and 80′ are tight on the shaft and move with it. 82 82 are projections on collar 79. 81 81 are the two forks of the upper end of lever 77. These forks extend one on each side of the drum-shaft, and each fork extends on each side of one of the projections 82. Each projection 82 has the two pins 83 extending parallel to the drum-shaft and toward the inclosed ends of the corresponding fork. Surrounding the pins are springs 84, which bear against the projection on one side and the end of the fork on the other. As the lever 77 vibrates the vibratory movement is communicated through springs 84 to the collar 79, drum-shaft, and drum. The vibrating lever acting as it does upon the drums through the medium of springs instead of by a positive connection will impart to the drums a continuous longitudinal vibration, wherein the objectionable dwell at the end of movement of the drum in either direction, which occurs when a positive connection is made, is practically eliminated. In the drawings this vibrating mechanism is applied to two of the drums, although it is obvious that it may be applied to one or all.

85 is a brush for dusting the work as it passes from under the sanding-drums. This brush is on a shaft 86, pivoted in arms 87 87, one on each side of the machine. These arms are secured to a shaft 88.

89 is a projection depending from one of the arms 87, engaging a set-screw 90, secured to the frame of the machine. By adjusting the nut-screw 90 the projection is swung so as to turn the shaft 88 in one direction or the other, thereby swinging the arms 87 so as to elevate or depress the brush 85. (See Figs. 1 and 2.)

To drive the drums, I provide the pulleys 91 on the drum-shafts 57 and the idle pulleys 92 on shafts 55′ 55′. The driving-belt extends up around one pulley 91, thence down around one pulley 92, thence up around another pulley 91, thence down around the other pulley 92, and thence up and around the remaining pulley 91.

It is obvious that the precise details in which my improvements have been embodied need not be adhered to, and I do not limit the invention to any details except those particularly enumerated in the claims.

I do not herein lay claim to the improved construction of drums and improved means for quickly removing the sheet of sandpaper from and replacing it on the drum and retaining it on the drum under tension, which is described in the preceding specification and particularly illustrated in Figs. 6, 6ª, and 7, as the same forms the subject-matter of a separate and divisional application filed by me December 23, 1899, Serial No. 741,370.

Having now fully described my invention, what I claim, and desire to protect by Letters Patent, is—

1. In a machine of the character described, the combination with the sanding-drums, of a conveyer arranged to travel beneath said drums, said conveyer consisting of a base, a series of conical-shaped elastic cushions on the outside of said base and plates having orifices corresponding in number and arrangement to said cushions, said plates being secured to the base and said cushions projecting through said orifices and above said plates, substantially as described.

2. In a machine of the character described, the combination with the sanding-drums, of sprocket-wheels arranged below said drums, an endless sprocket-chain engaging said wheels, a series of sections secured to said chain, a series of conical-shaped elastic cushions on the outside of said sections, plates having orifices corresponding in number and arrangement to said cushions, said cushions being inserted into the orifices in said plates from the under face thereof, said plates be-

ing secured to said sections, and means for imparting a movement of rotation to one of said wheels, substantially as described.

3. In a machine of the character described, the combination with the sanding-drums, of a conveyer arranged to travel beneath said drums, a table upon which said conveyer travels, a plurality of supports for said table, vertically-adjusting mechanism connected with all of said supports adapted when operated to raise or lower all of said supports simultaneously, and independent leveling devices connected with each of said supports whereby each of said supports may be raised or lowered independently of the others, substantially as described.

4. In a machine of the character described, the combination with a driving-shaft, of a sleeve loose upon the shaft and having a clutch member, gearing between said shaft and sleeve whereby said sleeve is rotated oppositely to the shaft, a clutch member on said sleeve, a clutch member on said shaft, and a sleeve or clutch between said clutch members, said sleeve or clutch being movable laterally to engage either of said clutch members, a plurality of upright screw-shafts, a table for the work, lugs on said table connected respectively with said screw-shafts, whereby said table is raised or lowered by the rotation of said screw-shafts in one direction or the other, and gearing between said sleeve or clutch and said upright shafts, whereby said table may be raised or lowered by throwing said sleeve or clutch into engagement with one or the other of said clutch members, substantially as described.

5. In a machine of the character described, the combination, with the sanding-drums, of a conveyer arranged to travel beneath said drums, a table upon which said conveyer travels and vertically-adjusting mechanism engaging said table and adapted to move said table vertically in a right line, substantially as described.

6. In a machine of the character described, the combination, with the sanding-drums, of a conveyer arranged to travel beneath said drums, a table upon which said conveyer travels, a plurality of upright screw-shafts arranged at each end of the length of the table and devices attached to said table and engaged by said screw-shafts whereby said table may be adjusted vertically, substantially as described.

7. In a machine of the character described, the combination, with the sanding-drums, of a conveyer arranged to travel beneath said drums, a table upon which said conveyer travels, a plurality of upright screw-shafts arranged at each end of the length of the table, lugs on said table, nuts on said screw-shaft, and springs interposed between said nuts and lugs, substantially as described.

8. In a machine of the character described, the combination, with the sanding-drums, of a conveyer arranged to travel beneath said drums, a table upon which said conveyer travels, a plurality of upright screw-shafts, lugs on said table, nuts on said screw-shaft, and springs and adjusting devices between said nuts and lugs, substantially as described.

9. In a machine of the character described, the combination with a driving-shaft, of a sleeve loose upon the shaft and having a clutch member, gearing between said shaft and sleeve whereby said sleeve is rotated oppositely to the shaft, a clutch member on said sleeve, a clutch member on said shaft, and a sleeve or clutch between said clutch members, said sleeve or clutch being movable laterally to engage either of said clutch members, a plurality of upright screw-shafts, a table for the work, lugs on said table connected respectively with said screw-shafts, whereby said table is raised or lowered by the rotation of said screw-shafts in one direction or the other, and gearing between said sleeve or clutch and said upright shafts, whereby said table may be raised or lowered by throwing said sleeve or clutch into engagement with one or the other of said clutch members, and leveling devices for adjusting each of said lugs independently of the corresponding screw-shaft and of the other lugs, substantially as described.

10. In a machine of the character described, the combination with the conveyer for the work, of a table for supporting the conveyer, lugs on said table, a nut for each lug, bolts connecting said lug and nut whereby said lug may be vertically adjusted positively in one direction, a spring between said lug and nut which when said bolts are loosened will move said lug vertically in the other direction, screw-threaded adjusting-shafts engaging said nuts, and mechanism connected with all of said shafts adapted to be connected with a source of power to rotate said shafts in either direction, thereby raising or lowering all of said nuts and lugs simultaneously, substantially as described.

11. In a machine of the character described, the combination with the conveyer for the work, of a table for supporting the conveyer, lugs on said table, a device connected with and supporting each of said lugs, adjusting means for raising or lowering each of said lugs with respect to its corresponding supporting device, and vertical adjusting mechanism connected to and supporting all of said devices whereby all of said lugs may be simultaneously raised or lowered, substantially as described.

12. In a machine of the character described, the combination, with a sanding-drum, of the drum-shaft, of arms pivoted opposite each end of said drum-shaft, each of said arms being pivoted at one end and having bearings between its ends for the reception of one end of the drum-shaft, and vertically-adjusting mechanism connected with the outer ends

of both arms, whereby said shaft may be raised or lowered at both ends simultaneously, substantially as described.

13. In a machine of the character described, the combination, with a sanding-drum, of the drum-shaft, arms pivoted opposite each end of the drum-shaft, each of said arms being pivoted at one end and having bearings between its ends for the reception of one end of the drum-shaft, and vertically-adjusting mechanism connected with the outer ends of both arms, whereby said shaft may be raised or lowered at both ends simultaneously, and leveling means at the pivot of one of said arms for raising or lowering the pivot and thereby raising or lowering the corresponding end of the drum-shaft, substantially as described.

14. In a machine of the character described, the combination with a sanding-drum, of the drum-shaft, arms pivoted opposite each end of said drum-shaft, each of said arms being pivoted at one end and having bearings between its ends for the reception of one end of the drum-shaft, and vertically-adjusting mechanism connected with the outer ends of both arms, whereby said shaft may be raised or lowered at both ends simultaneously, and independent leveling means for raising or lowering the end of said drum-shaft, substantially as described.

15. In a machine of the character described, the combination, with the sanding-drum, of the drum-shaft, arms pivoted opposite each end of said drum-shaft, each of said arms being pivoted at one end and having bearings between its end for the reception of one end of the drum-shaft, a box on the outer end of one of said arms, a shaft one end in bearings in said box, the outer end of the other of said arms holding to the other end of said shaft, a block horizontally slidable upon the machine-frame, said block having an orifice, an eccentric on said shaft engaging said orifice and means to rotate said shaft, substantially as described.

16. In a machine of the character described, the combination, with the sanding-drum, of the drum-shaft, arms pivoted opposite each end of said drum-shaft, each of said arms being pivoted at one end and having bearings between its end for the reception of one end of the drum-shaft, a box on the outer end of one of said arms, a shaft one end in the bearings in said box, the outer end of the other of said arms holding the other end of said shaft, a block horizontally slidable upon the machine-frame, said block having an orifice, an eccentric on said shaft engaging said orifice, a worm-wheel on said shaft within said box, and a worm engaging said worm-wheel, substantially as described.

17. In a machine of the character described, the combination, with a sanding-drum, of the drum-shaft, a pin opposite each end of said shaft, an arm pivoted to each pin, each arm having bearings between its ends for the reception of one end of the drum-shaft, one of said arms having an eccentric bearing upon its pin whereby it may be adjusted vertically independent of the other arm, and means for vertically adjusting both ends of said drum, substantially as described.

18. In a machine of the character described, the combination with the sanding-drum, of the drum-shaft, a pin opposite each end of said shaft, an arm pivoted to each pin, each arm having bearings between its ends for the reception of one end of the drum-shaft, one of said arms having an eccentric bearing upon its pin whereby it may be adjusted vertically independent of the other end, a box on the outer end of one of said arms, a shaft one end in bearings in said box, the outer end of the other arm holding the other end of said shaft, a block resting on and horizontally slidable upon, the machine-frame, said block having an orifice, an eccentric on said shaft engaging said orifice, and means to rotate said shaft, substantially as described.

19. In a machine of the character described, the combination with the sanding-drum, of the drum-shaft, a pin opposite each end of said shaft, an arm pivoted to each pin, each arm having bearings between its ends for the reception of one end of the drum-shaft, one of said arms having an eccentric bearing upon its pin whereby it may be adjusted vertically independent of the other end, a box on the outer end of one of said arms, a shaft, one end on bearings in said box, the outer end of the other arm holding the other end of said shaft, a block resting on and horizontally slidable upon, the machine-frame, said block having an orifice, an eccentric on said shaft engaging said orifice, a worm-wheel on said shaft within said box and a worm engaging said worm-wheel, substantially as described.

20. In a machine of the character described, the combination with the sanding-drums, of a conveyer arranged to travel beneath said drums, a table upon which said conveyer travels, a plurality of supports for said table, vertically-adjusting mechanism connected with all of said supports adapted to operate to raise or lower all of said supports simultaneously, independent leveling devices, connected with each of said supports whereby each of said supports may be raised or lowered independently of the others, vertically-adjusting mechanism for raising or lowering the drums, and leveling means for adjusting one end of each drum independently of the other end, substantially as described.

21. In a machine of the character described, the combination, with a sanding-drum, of the drum-shaft, a projection therefrom, capable of turning upon the shaft, but having no independent movement longitudinally thereof, a vibrator reciprocating longitudinally of the shaft, a spring arranged parallel with the shaft and between said projection and vibrator, and means for operating said vibrator, substantially as described.

22. In a machine of the character described, the combination, with a sanding-drum, of a vibrator reciprocating longitudinally of the shaft, and a spring arranged longitudinally of the shaft and interposed between the shaft and the vibrator, and means for operating said vibrator, substantially as described.

23. In a machine of the character described, the combination with a sanding-drum, of the drum-shaft, two fixed collars thereupon, a collar loose thereupon, and between the fixed collars, projections therefrom, pins extending from both sides of each projection and longitudinally of the shaft, a vibrator having a forked end, each fork having an inclosed end, springs interposed between the projections and the inclosed ends of the forks and surrounding said pins, and means for reciprocating said vibrator longitudinally of the shaft, substantially as described.

24. In a machine of the character described, the combination, with a sanding-drum, of a vibrator, a spring arranged longitudinally of the shaft, and interposed between the shaft and one end of the vibrator, said vibrator being pivoted between its ends on an axis transverse to the drum-axis, a box to which the other end of said vibrator is secured, a block adapted to slide vertically in said box, a driving-shaft, and an eccentric thereupon, said block having an orifice which said eccentric engages, substantially as described.

25. In a machine of the character described, the combination with a sanding-drum, of the drum-shaft, two fixed collars thereupon, a collar loose thereupon, and between the fixed collars, projections therefrom, pins extending from both sides of each projection and longitudinally of the shaft, a vibrator having a forked end, each fork having an inclosed end, springs interposed between the projections and the inclosed ends of the forks and surrounding said pins, said vibrator being pivoted between its ends on an axis transverse to the drum-shaft, a box to which the other end of said vibrator is secured, a block adapted to slide vertically in said box, a driving-shaft, and an eccentric thereupon, said block having an orifice which said eccentric engages, substantially as described.

26. In a machine of the character described, the combination, with the drums, the conveyer, and a table supporting the conveyer, of a brush, a shaft carrying same, arms pivoted thereto, a shaft to which said arms are secured, a projection extending from one of said arms, and an adjusting device engaging said projection and the frame of the machine, substantially as described.

In testimony of which invention I have hereunto set my hand, at Philadelphia, Pennsylvania, on this 22d day of November, 1899.

JAMES L. PERRY.

Witnesses:
FRANK S. BUSSER,
M. M. HAMILTON.