No. 808,180. PATENTED DEC. 26, 1905.

E. TYDEN.

SANDING MACHINE.

APPLICATION FILED OCT. 22, 1904.

3 SHEETS—SHEET 1.

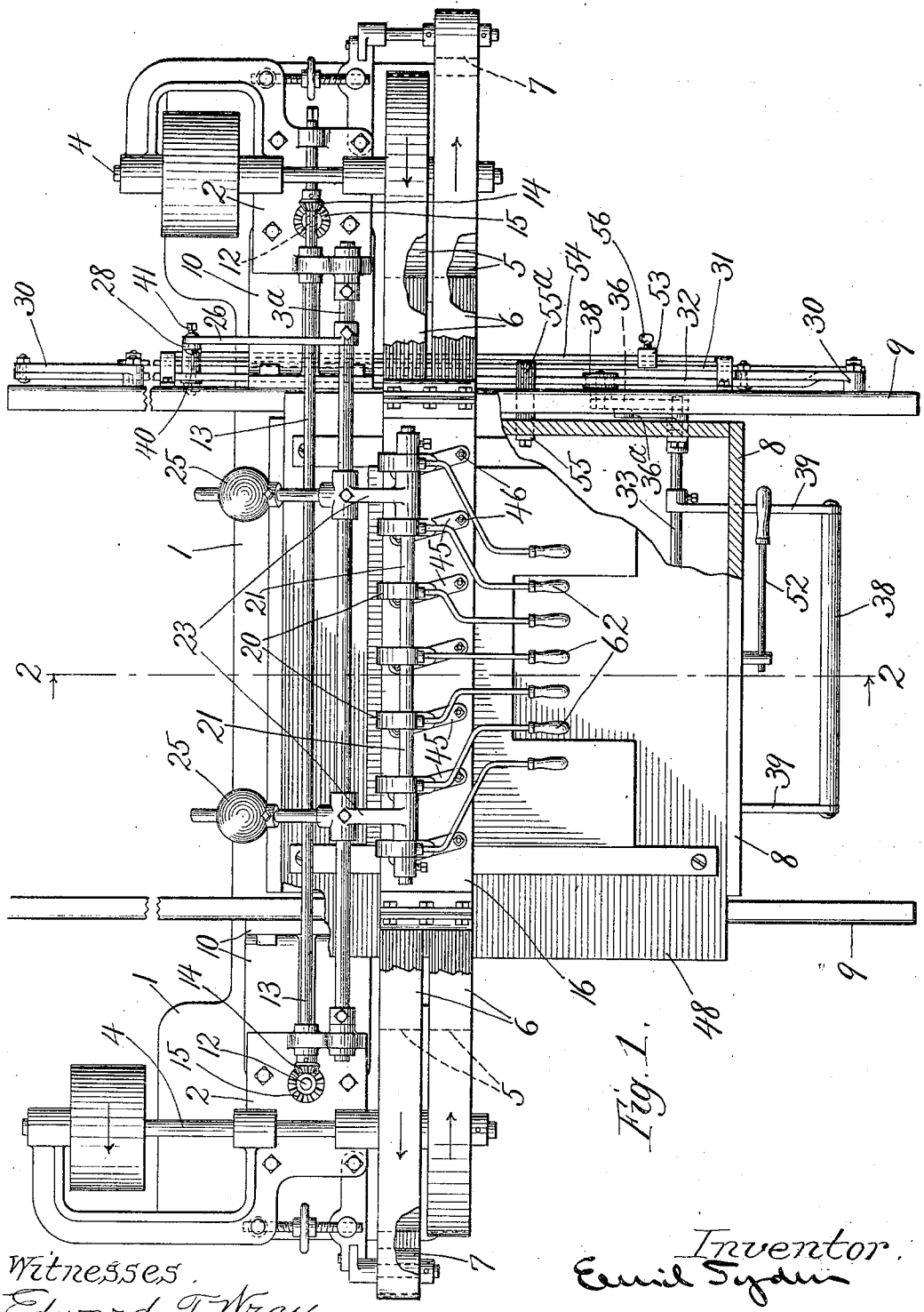


Fig. 1.

Witnesses.
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3 SHEETS—SHEET 2.

Fig. 2.

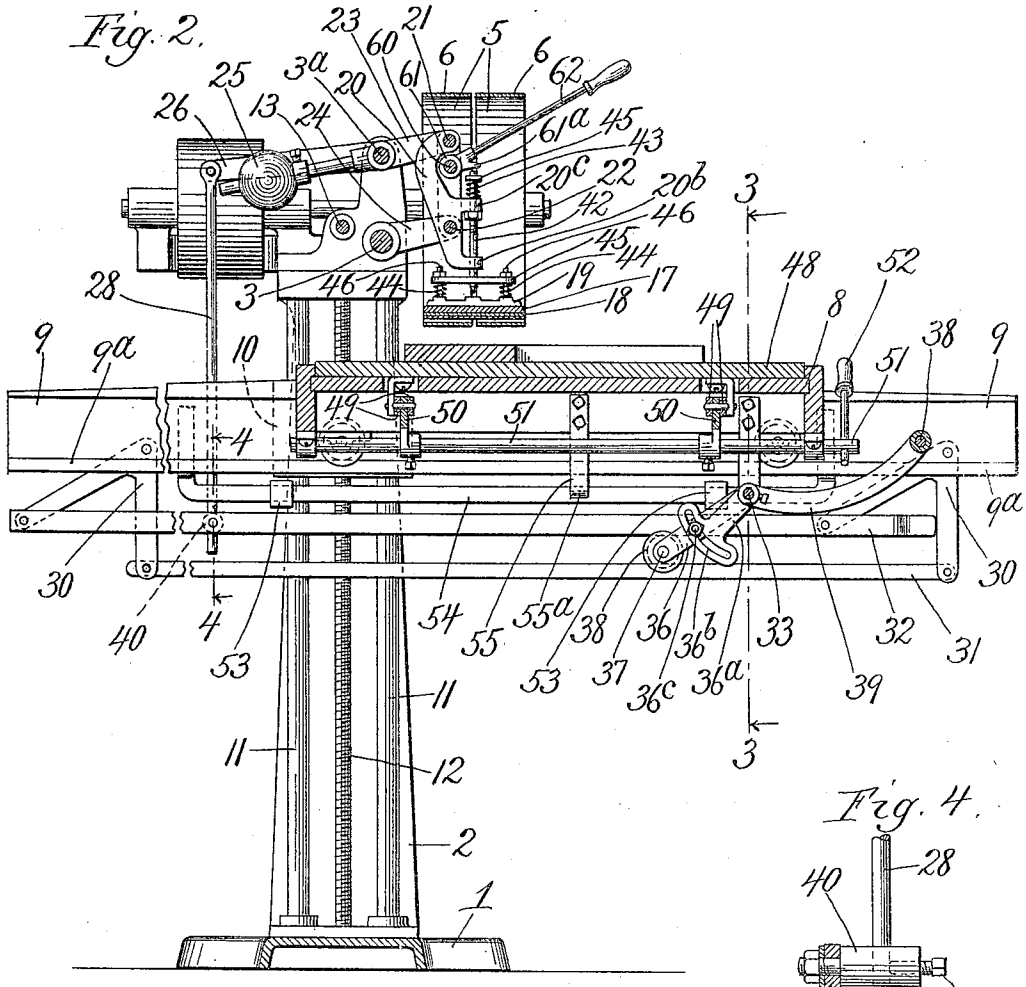
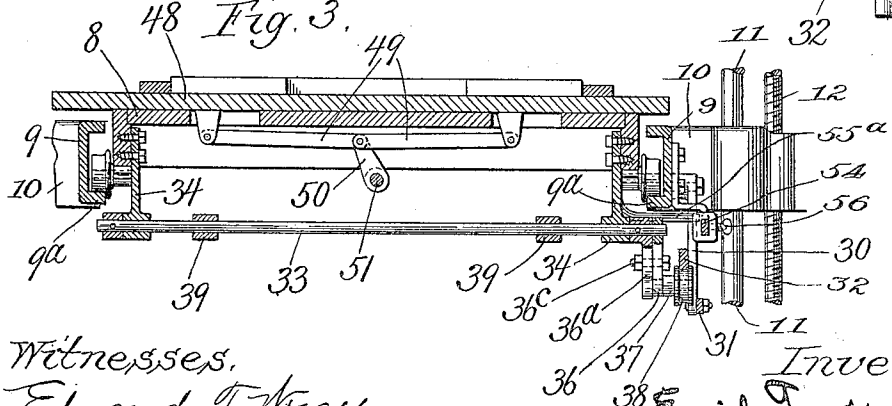


Fig. 4.

Fig. 3.



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3 SHEETS—SHEET 3.

Fig. 5.

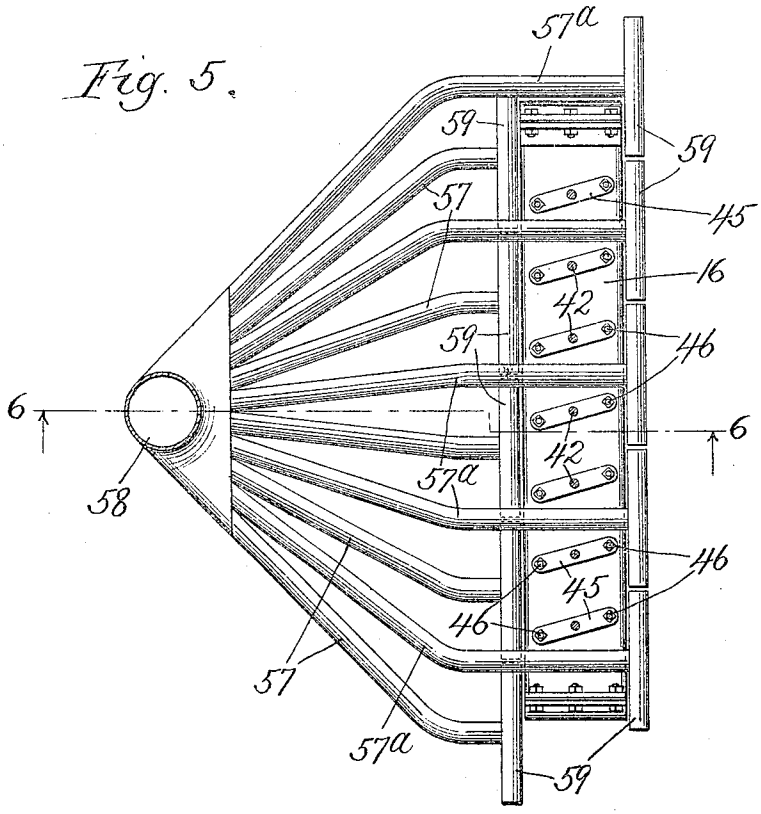
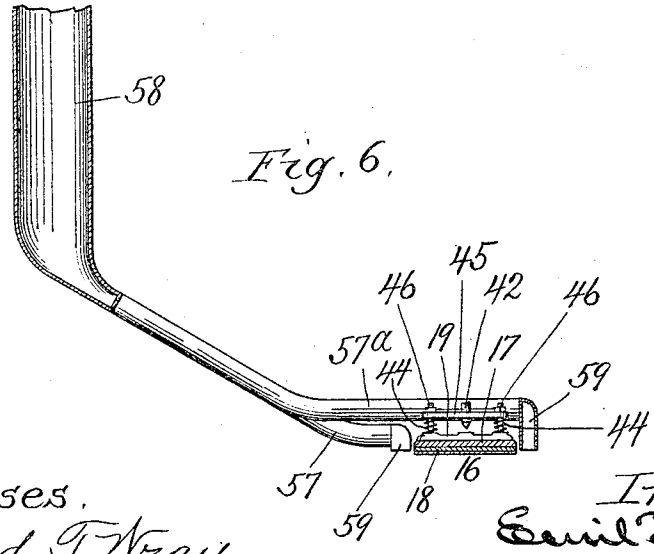


Fig. 6.



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UNITED STATES PATENT OFFICE.

EMIL TYDEN, OF HASTINGS, MICHIGAN.

SANDING-MACHINE.

No. 808,180. Specification of Letters Patent. Patented Dec. 26, 1905.

Application filed October 22, 1904. Serial No. 229,568.

To all whom it may concern:

Be it known that I, EMIL TYDEN, a citizen of the United States, residing at Hastings, in the county of Barry and State of Michigan, have invented new and useful Improvements in Sanding-Machines, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

This invention is designed as an improvement on sanding-machines shown in my applications, Serial No. 190,079, filed January 21, 1904; Serial No. 199,176, filed March 21, 1904, and Serial No. 211,910, filed June 10, 1904.

It consists in the features of construction set out in the claims.

In the drawings, Figure 1 is a plan view of a machine involving the said invention, the dust-collecting device being omitted. Fig. 2 is a fore-and-aft vertical section at the line 2 2 on Fig. 1. Fig. 3 is a detail section at the line 3 3 on Fig. 2. Fig. 4 is a detail section at the line 4 4 on Fig. 2. Fig. 5 is a partly-sectional plan view showing the dust-collecting device, same being represented in connection with the pressure-bar, section being made at horizontal plane directly above the pressure-bar. Fig. 6 is a section at the line 6 6 on Fig. 5.

This machine comprises a main frame consisting of base 1 and upright standards 2 2, connected at their upper ends from side to side of the machine by the round frame-bar or fixed shaft 3. Upon the upper ends of the upright standards 2 there are mounted the journal-bearings for the main operating-shafts 4 4, carrying the driving-pulleys 5 5 for two sanding-belts 6 6, which are driven in opposite directions, having their lower operating plies side by side overhanging the work for operating upon the same.

7 7 are take-up pulleys for controlling the tension of the sanding-belt, as fully described in my said pending applications.

The work is of course upon a work-table 8, mounted for movement horizontally fore and aft on tracks 9^a 9^a, formed upon cross-heads 9 9, which terminate brackets 10 10, each mounted for sliding vertically upon two guide-posts 11 11, rigid with each of the end standards 2 2. For adjusting the work-table vertically there are two vertical screw-shafts 12 12, one upon each standard, taking through suitable threaded bearings in the brackets 10 10, respectively, and operatively connected at their upper end by a horizontal shaft 13, having beveled pinions 14 14, meshing with similar beveled pinions 15 15 at the upper ends of the vertical shafts 12 12, respectively, and suitable means (not shown) is provided for rotating the horizontal shaft to adjust the work-table up and down.

For holding the operating plies of the sanding-belts to the work there is provided a pressure-bar 16, the particular construction of which is more fully set out in my said application, Serial No. 211,910, as consisting of an elastically-flexible element 17, having on its under side a suitable cushioning-covering 18 and carried by a plurality of presser-feet 19, which are supported elastically in hangers 20, such hangers being mounted on two parallel horizontal shafts 21 and 22, which extend in front of and parallel with the fixed shafts 3 3^a and are connected therewith by parallel links 23 and 24, pivotally mounted on said shafts 3 and 3^a, respectively. The entire weight of the hangers 20 and the presser-feet carried thereby is counterbalanced by weighted lever-arms 25 25, which extend rigidly from the links 23 23 rearward from the shaft 3^a. The presser-bar is adapted to be depressed upon the upper surface of the lower or operating ply of the belts by means provided for rocking the links 23 and 24 about their respective shafts, such means consisting of a lever-arm 26, extending rearward from the shaft 3^a and connected by a link 28 with mechanism mounted on the right-hand cross-head 9. Said mechanism consists of two bell-crank levers 30 30, whose two arms are formed at an angle of about forty-five degrees to each other and in ordinary position stand with one of said arms depending vertically from the fulcrum and the other extending down rearwardly at said forty-five-degree angle. The two vertical arms are connected by a link 31 and the two oblique arms are connected by a link 32, which serves as an operating-bar. Upon the work-table there is mounted for rocking a horizontal rock-shaft 33, the same being journaled in brackets 34 34, which depend rigidly from the lower side of the work-table, so that the rock-shaft extends out past the right-hand cross-head 9 and under the same, as is provided with a lever or crank arm 36, at the end of which there is a wrist-stud 37, on which is mounted an antifriction-roller 38 in position to bear upward against the lower edge of the bar 32. The rock-shaft 33 has an operating-handle 38 offset forwardly from

the rock-shaft to which it is connected by the two arms 39 39 at the opposite ends of said handle, the handle being of such length that the operator standing in front of the machine may readily reach it at any position, right or left, to which he may move for controlling different parts of the mechanism. The bar 32 carries near the rear end a horizontally-jutting pivoted stud 40, through which the link 28 extends and in which it is adapted to be set fast by a set-screw 41, set in through the end of the stud to impinge upon the side of the link. With this construction it will be seen that by depressing the handle 38 the operator will throw upward the lever-arm 26 for depressing the hangers and their presser-feet to depress the pressure-bar onto the operating plies of the sanding-belts and that the roller 38, traveling along the under edge of the bar 32 as the table is caused to travel on the tracks 9^a, will operate for transmitting the movement from the rock-shaft 33 at all positions along said bar, and that by thus mounting the rock-shaft on the work-table and providing such traveling connection of the roller 38 on the bar 32 from the rock-shaft 33 to the mechanism for rocking the shaft 3^a such action is rendered equally convenient to all positions of the operator and at all points of advancement of the work with respect to the sanding-belts. To permit adjusting the handle-bar 38 to convenient position for the operator, there is pinned fast to the shaft 33 an arm 36^a, having a segmental slot 36^b, which receives a bolt 36^c for binding said arm fast to the lever-arm 36, with range of angular adjustment to the limit of the segmental slot. In order to limit the fore-and-aft movement of the work-table and render such limit adjustable, so that it may correspond to the extent of the particular work operated upon, so that the operator may avoid running beyond the belts in each movement fore and aft without the necessity of closely observing his own movement to avoid this, I provide stops 53 53, mounted upon the bar 54, which is bolted to the side of one of the cross-heads 9, which have the tracks for the work-table, and to the work-table at the under side there is secured a bracket 55, having a horizontally-jutting arm or finger 55^a, which projects alongside the bar 54, playing between the stops 53 53, which arrest the movement of the table in each direction. Each stop is secured as adjusted on the bar by a thumb-screw 56. (See Fig. 1.)

The presser-feet are mounted elastically in the hangers, as stated, in a manner which is clearly seen in Figs. 2 and 6 and shown in my said application Serial No. 211,910, by means of their stems or spindles 42, extending through bearings 20^b 20^c on the hangers, with a spring 43 interposed between the upper bearing 20^c and a stop-nut 45 screwed onto the upper end of the spindle and with springs 44 44 interposed between the presser-feet and the cross-bar 45, which is rigid with the stem 42 at the lower end thereof and attached to the presser-feet by bolts 46 46, around which the springs 44 44 are lodged. For depressing the presser-feet separately to apply special pressure to the pressure-bar at the several points at which the presser-feet are situated there is provided a shaft 60, carried by links 60^c, connecting the corresponding ends of the shafts 21 and 22, and there are mounted upon the shaft 60 collars 61 61, &c., one for each of the presser-feet, having a short lever-arm 61^a overhanging the spindle 42 and having a handle-lever 62 extending forward in position to be reached by the operator. These handle-levers converge from the two ends toward the middle, so that they all stand in comparatively close order at the middle part of the machine, so that the operator can reach any one of them at will for rocking the collar on the shaft to bring the short lever-arm against the spindle to depress the presser-foot corresponding to the handle-lever operated.

The presser-feet are preferably mounted on their spindles so as to extend obliquely across the pressure-bar and with respect to the direction of travel of the sanding-belts in order that their pressure may be exerted over a zone or belt of some width and so that together they may be adapted to transmit pressure to as large a part as possible of the entire area of the pressure-bar, and their purpose is to enable the operator to apply special pressure to any particular spot of the work which for any reason may require such special pressure for obtaining uniform result from the action of the sanding-belts. The particular part of the work requiring such special pressure in any given instance may not happen to stand directly under any one of the presser-feet, and in order that notwithstanding this it may be possible to reach such particular part and apply the special pressure thereto there is mounted upon the work-table for holding the work a sliding frame 48, within which the work may be held by edge clamps, and this frame is connected by links 49 49, by lever-arms 50 50 of a rock-shaft 51, which is mounted on the under side of the work-table, and is provided at the forward side with a lateral handle 52, by which it may be rocked to slide the frame 48 to the right or left, more or less, so as to carry the work in either direction to bring any particular part directly under one of the presser-feet, so that special pressure may be applied to such part, as desired.

It is desirable that the dust from the sanding-belts should be taken away from the lateral edges of the belts as fast as it escapes from under the same in order to enable the operator to observe the condition of the work and adapt the pressure thereto at the various

points controlled by the presser-feet. For this purpose I provide branch dust-pipes 57 57 57, &c., from the air-main 58, each dust-pipe having a wide mouth 59 and these mouths overhanging the work just outside the lateral margins of the two belts. Preferably alternate branch pipes 57[a] extend between the stems of the presser-feet to permit their expanded mouths to overhang the forward margin of the forward belt, while the other alternate pipes have their expanded mouths overhanging the rear margin of the rear belt, as seen in Figs. 5 and 6.

I claim—

1. In a sanding-machine, in combination with a supporting-frame, a work-table mounted for movement horizontally on the frame; a sanding device overhanging the work-table and means for actuating it; a pressure-bar overhanging such sanding means and movable for pressing it on the work; means for so moving the pressure-bar comprising mechanism supported on the frame above the work-table; mechanism supported on the frame below the work-table; connections from the former mechanism to the latter, said latter comprising a horizontal track and means for actuating said pressure-bar-operating mechanisms mounted on the work-table and carried thereby in the horizontal movement of the latter, said means consisting of a traveler and means for holding it pressed against the track-bar.

2. In a sanding-machine in combination with a supporting-frame; a work-table mounted on the frame for horizontal movement; a sanding-belt having its operating ply overhanging the work-table and means for driving it in direction transverse to the movement of the table; a pressure-bar overhanging said operating ply movable toward and from the same for pressing the belt upon the work; means for so moving the pressure-bar comprising mechanism mounted on the frame below the table, mechanism mounted on the frame above the table and connections from the former mechanism to the latter, the mechanism below the table comprising a horizontal track-bar and devices mounted on the work-table and carried thereby in the movement of the latter, said devices comprising a traveler which bears upon the horizontal track-bar and means for holding it pressed thereagainst.

3. In a sanding-machine in combination with a frame, a work-table mounted thereon for horizontal movement; a sanding device overhanging the work-table and means for actuating it; a pressure-bar overhanging the sanding means and movable for pressing the latter toward the work; mechanism mounted on the frame above the work-table for so operating the pressure-bar and parallel-movement mechanism mounted on the frame below the work-table comprising a horizontal track-bar and parallel links by which it is supported on the frame; a link connecting said parallel-movement mechanism with the pressure-bar-operating means above the table and means mounted on the table for actuating said parallel-movement mechanism consisting of a traveler and connections for holding it pressed against the horizontal track-bar.

4. In a sanding-machine in combination with a supporting-frame, a work-table mounted thereon for horizontal movement; a sanding device and means for actuating it overhanging the work-table; a pressure-bar for pressing the sanding device against the work; a rock-shaft mounted upon the frame above the table and connections therefrom for operating the pressure-bar and a lever-arm for operating the rock-shaft; a parallel-movement mechanism mounted on the frame below the work-table comprising a horizontal track-bar and parallel links by which it is carried upon the frame; a link connecting said parallel-movement mechanism with said rock-shaft lever-arm, and means mounted on the work-table for operating said parallel-movement mechanism consisting of a traveler bearing on the horizontal bar of said mechanism and means for holding it pressed thereagainst as the work-table moves horizontally.

5. In a sanding-machine in combination with a frame, a work-table mounted for movement horizontally thereon; a sanding device overhanging the work-table and means for actuating it; a pressure-bar overhanging the sanding device and movable for pressing the latter to the work; mechanism supported on the frame above the work-table for so operating the pressure-bar; a parallel-movement mechanism mounted on the frame below the work-table comprising a horizontal track-bar; two bell-crank levers having their corresponding arms extending parallel obliquely to the track-bar to constitute links for supporting such track-bar on the frame for parallel movement, the other corresponding arms of the bell-crank lever being also parallel at the lowest position of the horizontal bar approximately at right angles to the latter, and a link-bar connecting said last-mentioned parallel lever-arms; connections from said parallel-movement mechanism to the pressure-bar-operating mechanism above the table and devices for operating the parallel-movement mechanism mounted upon the work-table and carried thereby in the horizontal movement of the latter, said devices comprising a traveler bearing upon the track-bar which connects the oblique lever-arms or links and means for holding it pressed thereagainst throughout the horizontal movement of the table.

6. In a sanding-machine, in combination with a frame, a work-table mounted thereon

for horizontal movement; a sanding device overhanging the work-table and means for actuating it; a pressure-bar overhanging the sanding device movable for pressing the latter to the work; mechanism supported on the frame above the work-table for so operating the pressure-bar; parallel-movement mechanism supported upon the frame below the work-table and operating connections therefrom to the pressure-bar-operating mechanism above the work-table, said parallel-movement mechanism comprising two similar bell-crank levers fulcrumed on the frame, said levers having corresponding arms extending obliquely from the fulcrum parallel to each other and constituting links for supporting the horizontal bar, such horizontal bar connected to such oblique arms or links and constituting a track-bar, the other corresponding arms of the bell-crank levers being also parallel and extending normally substantially in vertical direction, the track-bar being extended past its pivotal connection with one of the oblique lever-arms toward the vertical arm of the same lever and being stopped thereagainst substantially at the vertical position of the latter, and means mounted on the work-table for pressing upon said track-bar comprising a traveler bearing thereon and means for holding it pressed thereagainst.

7. In a sanding-machine, in combination with a supporting-frame, a work-table mounted thereon for horizontal movement; a sanding device overhanging the work-table and means for actuating it; a pressure-bar overhanging the sanding device movable for pressing the latter onto the work; mechanism mounted on the frame above the work-table for so operating the pressure-bar, said mechanism comprising an element weighted for upholding the pressure-bar and a lever-arm for depressing it; parallel-movement mechanism mounted on the frame below the work-table and operating connections therefrom to said lever-arm, said parallel-movement mechanism comprising a horizontal track-bar; means mounted on and carried by the work-table in the horizontal movement of the latter for operating said parallel-movement mechanism consisting of a traveler extending under the horizontal track-bar and means for holding it pressed upward against the latter throughout the horizontal movement of the table.

8. In a sanding-machine, in combination with the frame, a sanding-belt overhanging the work-table and means for actuating it to propel its operating ply transverse to the movement of the table; an elastically-flexible pressure-bar overhanging the operating ply of the sanding-belt; a plurality of presser-feet distributed along the length of the pressure-bar above the same for pressing it against the belt; means for depressing said presser-feet, each separately and independently of the remainder, comprising lever-arms or handles extending from the respective presser-feet-operating devices convergingly forward for reducing the compass of the group of such handles.

9. In a sanding-machine, in combination with a frame, a work-table mounted thereon for horizontal movement; a sanding-belt overhanging the work-table and means for actuating it to propel its operating ply transversely to the movement of the table; a pressure-bar overhanging said operating ply; means for depressing it bodily to press said ply to the work, said means comprising a plurality of presser-feet distributed over the length of the pressure-bar and connected thereto for supporting the latter; means for supporting and operating said presser-feet comprising springs for said presser-feet respectively, upon which they are severally upheld yieldingly, and separate means for depressing the several presser-feet independently against the elastic support of their respective springs, and operating-handles or lever-arms extending from said depressing means respectively.

10. In a sanding-machine in combination with the frame, a work-table mounted thereon for horizontal movement; a sanding-belt overhanging the work-table and means for actuating it to propel its operating ply transversely to the movement of the work-table; an elastically-flexible pressure-bar suspended above said operating ply; a plurality of presser-feet distributed over the length of the pressure-bar for separately pressing upon the same at their respective positions to direct or increase the pressure of the sanding-belt on the work at such positions respectively; a work-holder on the work-table and means for moving such work-holder at will transversely with respect to the horizontal movement of the work-table.

11. In a sanding-machine in combination with the frame, a work-table mounted thereon for horizontal movement; a sanding-belt overhanging the work-table and means for actuating it to propel its operating ply transversely to the movement of the work-table; an elastically-flexible pressure-bar suspended above said operating ply; a plurality of presser-feet distributed over the length of the pressure-bar for separately pressing upon the same at their respective positions to direct or increase the pressure of the sanding-belt on the work at such positions respectively; a work-holder mounted upon the work-table for movement transversely with respect to the horizontal travel of said table on the frame; a rock-shaft mounted under the work-table having lever-arms and links from said lever-arms connected with the work-holder for so moving the latter.

12. In a sanding-machine, in combination

with sanding-belts and the work-table mounted for work-carrying movement transversely to the belt's travel, a multiplicity of branch exhaust-pipes extending from the rear forwardly to the belts, alternate pipes being provided with their expanded mouths overhanging the work at the rear margin of the rear sanding-belt, the other alternate pipes being extended over the belts and having their expanded mouths overhanging the work at the forward margin of the forward belt.

13. In a sanding-machine, in combination with a frame, a work-table mounted thereon for horizontal movement; a sanding device overhanging the work-table and means for actuating it; a pressure-bar overhanging the sanding device movable for pressing the latter to the work; mechanism supported on the frame above the work-table for so operating the pressure-bar; mechanism supported on the frame below the work-table and operating connections therefrom to the pressure-bar-operating mechanism above the work-table, said mechanism below the table comprising a bar which is movable up and down; a rock-shaft mounted on the work-table provided with an offset handle-bar and a lever-arm on said rock-shaft having an abutment for operating against the vertically-movable bar on the frame.

14. In a sanding-machine, in combination with a frame, a work-table mounted thereon for horizontal movement; a sanding device overhanging the work-table and means for actuating it; a pressure-bar overhanging the sanding device movable for pressing the latter to the work; mechanism supported on the frame above the work-table for so operating the pressure-bar; mechanism supported on the frame below the work-table and operating connections therefrom to the pressure-bar-operating mechanism above the work-table, said mechanism below the table comprising a bar which is movable up and down; a rock-shaft mounted on the work-table provided with an offset handle-bar and a lever-arm on said rock-shaft having an abutment for operating against the vertically-movable bar on the frame, said lever-arm being adjustable angularly about the rock-shaft, the rock-shaft having a second arm made fast to it extending alongside the adjustable lever-arm, one of said arms being segmentally extended and slotted and the bolt taken through the slot for binding it to the other arm at adjusted position of the adjustable frame.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, at Hastings, Michigan, this 13th day of October, A. D. 1904.

EMIL TYDEN.

In presence of—
FRED W. STEBBINS,
M. C. LAMBIE.