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PATENTED NOV. 21, 1905.

E. TYDEN.
SANDING AND POLISHING MACHINE.

APPLICATION FILED JUNE 10, 1904.

3 SHEETS—SHEET 1.

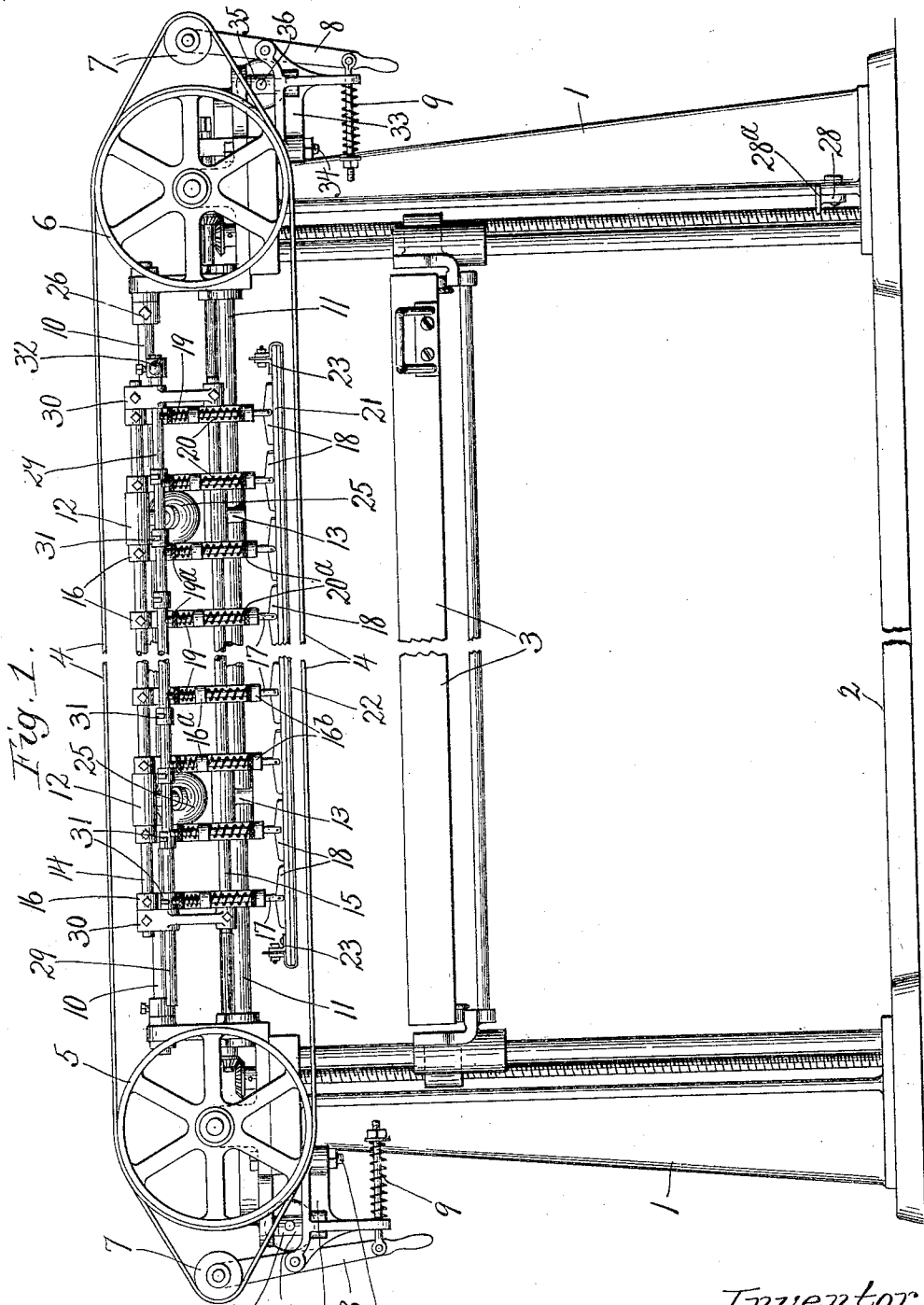


Fig. 1.

Witnesses.
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Emil Tyden
by his Attys. Dunton Dunton

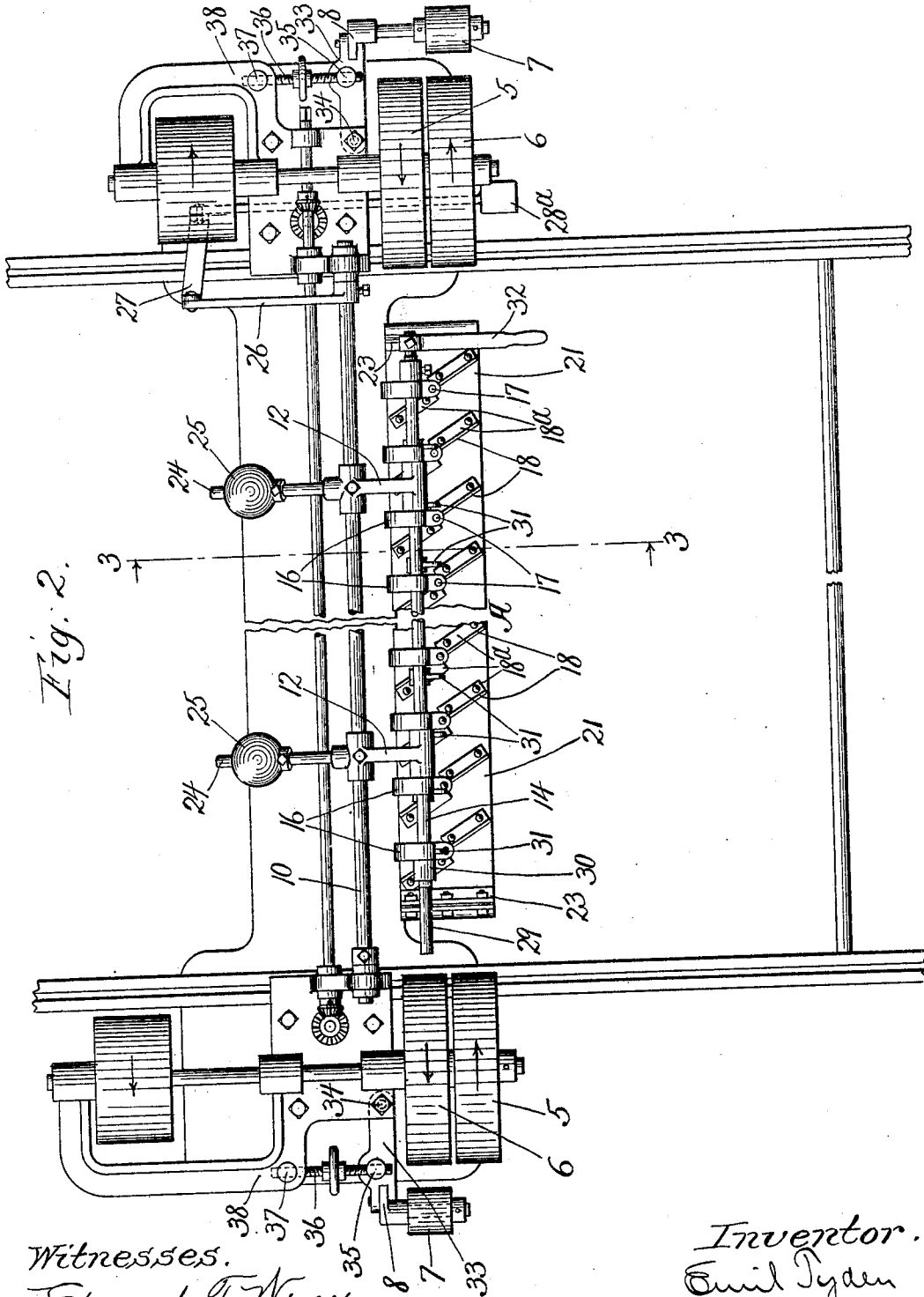
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3 SHEETS—SHEET 2.



Witnesses.

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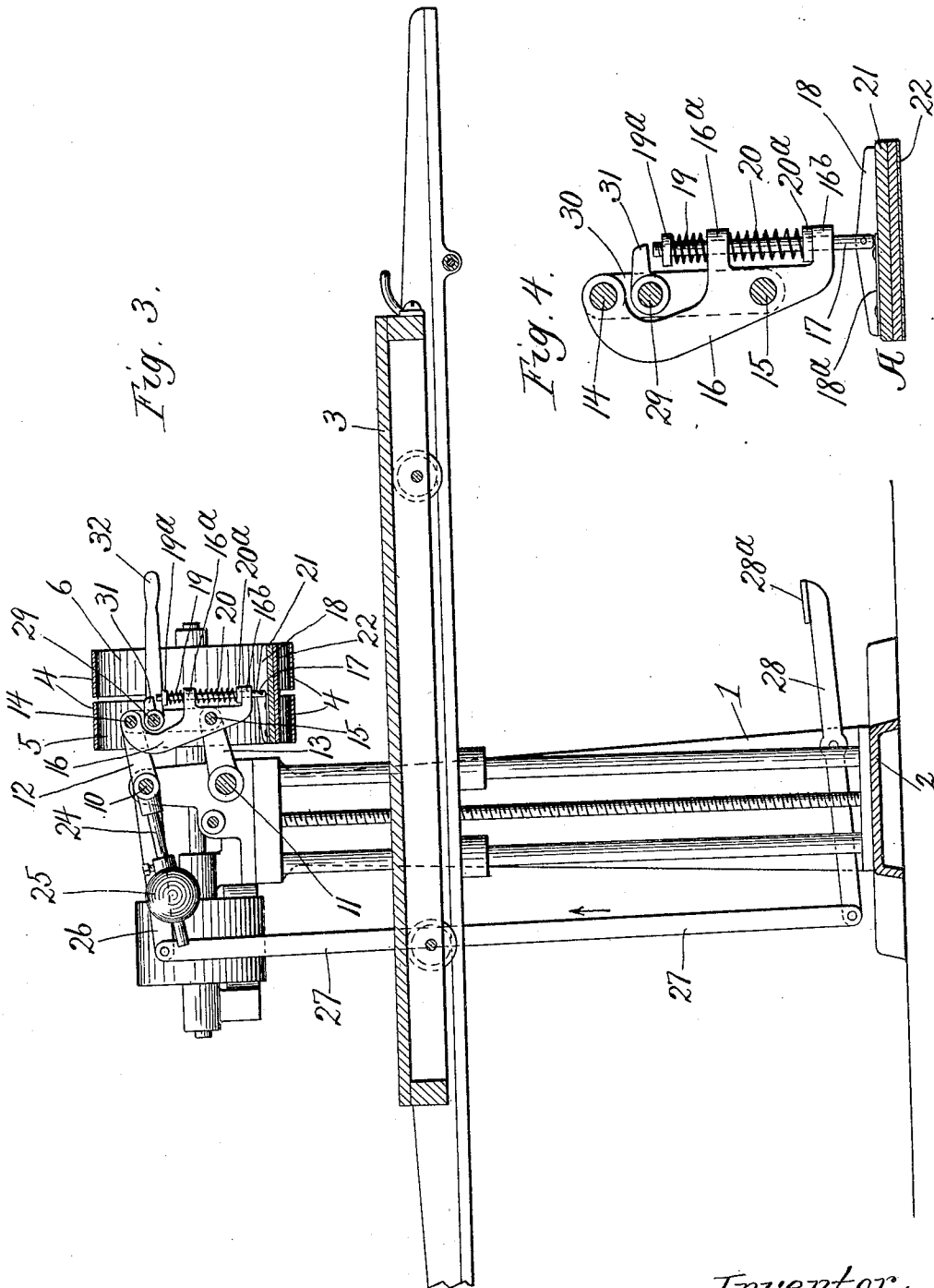
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3 SHEETS—SHEET 3.



Witnesses.

Edward T. Wray
Fred B. Fischer

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UNITED STATES PATENT OFFICE.

EMIL TYDEN, OF HASTINGS, MICHIGAN.

SANDING AND POLISHING MACHINE.

No. 804,902.

Specification of Letters Patent.

Patented Nov. 21, 1905.

Application filed June 10, 1904. Serial No. 211,910.

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 and Polishing Machines, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

This invention is designed to be an improvement in the class of sanding and polishing machines in which an endless belt is the sanding or polishing element.

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

In the drawings, Figure 1 is a front elevation of a machine embodying my improvements. Fig. 2 is a top plan. Fig. 3 is a section at the line 3 3 on Fig. 1. Fig. 4 is a partly-sectional detail of one of the brackets in which the presser-feet are journaled.

My improved machine comprises a frame consisting of upright standards 1 1, connected by a base 2, between which standards a work-table 3 is extended and upheld by means adapting it to be adjusted vertically and moved horizontally to carry the work past the sanding-belts 4 4 transverse to the travel of said belts, which are driven in opposite directions by their respective driving-pulleys 5 5 and around their respective guide-pulleys 6 6, in which course they are held suitably taut by the take-up rolls 7 7, mounted on the levers 8 8 and operated for stretching the belts by the springs 9 9, connected with the levers 8 8, respectively.

The construction thus far described, in so far as it is novel and of my invention, is shown in my pending applications Serial No. 190,079, filed January 21, 1904, and Serial No. 199,176, filed March 21, 1904, and is not the subject of this application, and the details of the structure in these respects need not be further described herein. The features constituting this invention relate to the means of applying the pressure for holding the sanding or polishing belt to the work, and the devices for this purpose will now be described.

The end standards 1 1 at the upper part are connected by parallel shafts or bars 10 and 11, and these shafts are connected by parallel links 12 12 and 13 13 with two other parallel shafts 14 and 15, which extend in front of the shafts 10 and 11. On the shafts 14 and 15 there are mounted brackets or hangers 16 16 16 a few inches apart and of

number varying with the size of the machine, and in these brackets 16 spindles or stems 17 of obliquely-trending presser-feet 18 are vertically journaled. Each of the presser-feet is upheld with relation to the bracket in which it is mounted by a spring 19, coiled about the stem 17 above the upper guide-bearing 16^a of the stem in the bracket and stopped under a tension-nut 19^a, screwed onto the upper end of the stem. Another spring 20 is coiled around the stem between the upper guide-bearing 16^a and the lower guide-bearing 16^b of the stem in the bracket, said spring being stopped at the upper part against the under side of the upper bearing and at the lower end against the stop-collar 20^a on the stem. The presser-foot 18 is made of sheet metal split and folded at the lower edge to form two oppositely-projecting flanges 18^a 18^a, by which it is riveted or otherwise suitably secured to the upper side of a comparatively stiff elastically-flexible plate or bar 21, which extends longitudinally with respect to the sanding-belts above the latter and constitutes the basis or foundation element of the presser A. This bar or plate 21 is quite satisfactorily made of any tough wood from one-fourth to three-eighths of an inch thick. The remainder of the presser-bar comprises a thin elastically-flexible metal band 22, extended along under the bar 21 and folded up around the end of the latter and rigidly joined to it by means of the angle-fittings 23 23 at the ends, and between said upper bar 21, of wood, and the lower band 22, of flexible metal, there is interposed any suitable cushioning material, as felt or rubber-cloth or hair or other soft fibrous mass. The entire weight of the brackets 16 and the presser-feet mounted therein, as described, and of the presser-bar carried by said presser-feet is counterbalanced by weighted lever-arms 24 and their weights 25, which extend from the links 12 12 rearward of the shaft 10; but said presser-bar is designed to be depressed upon the upper surface of the lower or operating ply of the belts, and for that purpose the shaft 10 is provided with a lever-arm 26, extending rearward and connected with the thrust-rod 27, which extends up from the rear end of the pedal-lever 28, so that when the pedal 28^a is depressed said rod 27, being thrust upward, lifts the lever-arm 26 and rocks the shaft 10 in direction to depress the presser-bar 21, and thereby the operator applies to the belts throughout the entire length

of the presser-bar, which is presumed to be the entire width of the work being operated upon lying on the table, the necessary pressure to cause the belts to perform their function upon the work.

A specific purpose of this invention is to enable the operator to vary the pressure somewhat at different points in the length of the presser-bar as may be necessary in order to properly finish the work at all parts of the surface when the different character of the wood being operated upon or slight inequalities of the surface make uniformity in the pressure throughout the entire length of the presser-bar ill adapted to finish all parts alike. For this purpose provision is made for depressing any one of the presser-feet 18, so as to cause it to apply special pressure to the part along the presser-bar upon which it rests and to which it is attached, and so to slightly deflect the presser-bar downward at that point and slightly increase the pressure upon the work which may be effected by depression of the individual presser-foot. The means for this purpose consists of a rock-shaft 29, journaled in two link-bars 30 30, which, in addition to the brackets 16, connect the shafts 14 and 15 at opposite ends of the system of said brackets or hangers 16. This shaft is provided with tappets 31 31, corresponding to the several presser-feet and secured to the shaft at intervals a little less than the standard intervals between the spindles of the presser-feet, said shaft being longitudinally movable in its bearings and also adapted to be rocked therein and provided with a lever-arm 32 for rocking it. If the shaft is adjusted longitudinally in its bearings, so that the extreme tappet at the left, for example, is directly over the extreme spindle at the left, the next tappet will overhang, but not be directly over the next tappet at the right, and the third tappet and all following at the right will be out of line with their respective spindles—that is, will not overhang them so as to operate upon them if the shaft is rocked. If the operator desires to depress only the left-hand presser, the shaft being moved a little more to the left will cause the second tappet, as well as all the remainder to the right, to be out of line with the spindles, and only the extreme left-hand tappet will be in position for operating upon the spindle when the shaft is rocked. For engaging the second spindle only the shaft may be moved to the right far enough to cause the first tappet to just clear its spindle and the second tappet to just engage its spindle, all the remainder of the tappets to the right missing their spindles. A little further movement of the shaft to the right will cause the second and third tappets to engage their spindles, the first tappet and all to the right of the third being out of line and missing their spindles. It will be read-

ily understood that by adjustment of the shaft longitudinally in its bearings the operator can select any one spindle or any two consecutive spindles for action and can apply any desired pressure by means of the lever 32 to the presser-feet thus selected for increasing the pressure by which the belt acts upon the selected area of the work.

In order that the pressure transmitted by the presser-feet about the presser-bar shall not have the effect of producing lines of pressure on the work between which the pressure would be lighter, so causing undulations in the surface, the presser-feet are extended obliquely across the presser-bar, as above described and shown, the width of the presser-bar and corresponding length of the feet being related to the distance between the consecutive presser-feet, so that the rear point of each presser-foot, except the extreme one to the left, stands in fore-and-aft line behind the forward point of the next one to the left—that is, so that the area of pressure transmitted by each presser-foot meets or laps slightly onto the area of the pressure transmitted to the next at either side.

It will be noticed that with the construction shown the presser-bar is suspended substantially on the springs 19 above the upper spindle-bearing and is adapted to yield upward against the springs 20 20 between the spindle-bearings.

It will be noticed that each of the presser-feet can be depressed at will independently of the remainder by the operator reaching the same and applying any desired pressure for any desired length of time. The rock-shaft with its tappets is only a preferred and not an indispensable means for selecting and applying pressure to individual presser-feet, and this means may be used in conjunction with the more direct means, such as directly pressing down any presser-foot by hand—as, for example, when there are two spots on the work which require special pressure at the same time, only one of which may be within the range of two of the presser-feet. In such case the operator may reach one of the spots by proper adjustment of the rock-shaft and rocking it to cause its tappets to engage one or two of its presser-feet, while another spot may be reached by pressing down with the hand the proper presser-foot. I do not limit myself to the means for selecting the presser-feet nor to employment of any means beyond making the presser-feet at some point properly accessible for the application of pressure by hand; but the specific means consisting of the adjustable rock-shaft I consider to have in itself special utility, and it is therefore specifically claimed.

In order to correct the position or path of travel of the belts which might become incorrect by reason of slight inequality of stretch at the opposite edges, I mount the

take-up lever-arm 8 on a bracket or frame 33 and pivoted on a vertical pivot 34, parallel with the plane of travel of the belt. The bracket or frame 33 is connected with the frame 38 by means of a right-and-left screw 36, which takes into the nuts 33 and 37, swiveled on the bracket 33 and frame 38, respectively. By turning the right-and-left screw 36 in the required direction the pivoted bracket or frame 33 is moved about its pivot 34 and carries with it the take-up roll 7, thereby adjusting and varying the tension of the belt and correcting its position.

I claim—

1. In a sanding or polishing machine in combination with a sanding or polishing belt, a work-table movable transversely with respect to the travel of the belt; an elastically-flexible pressure-bar supported at the opposite side of the operating ply of the belt from the work-table, and a multiplicity of pressure-feet at the opposite side of the pressure-bar from said ply of the belt, said feet being movable toward and from said ply, and means for thrusting them individually and independently toward the same.

2. In a sanding or polishing machine in combination with a sanding or polishing belt, a table for supporting the work movable to carry the work transversely with respect to the travel of the operating ply of the belt; an elastically-flexible pressure-bar overhanging said operating ply; means for moving the pressure-bar bodily toward and from said ply; a multiplicity of pressure-feet distributed at intervals along the length of the pressure-bar at the opposite side thereof from said operating ply, and means for thrusting said feet individually and independently toward said ply.

3. In a sanding and polishing machine in combination with a sanding or polishing belt; a work-table movable to carry the work transversely with respect to the travel of the operating ply of the belt; an elastically-flexible pressure-bar overhanging said operating ply; means for moving the pressure-bar bodily toward and from said ply to press the latter against the work, said means comprising a multiplicity of elastically-yielding pressure-communicating connections for carrying said pressure-bar distributed at intervals along the length of the latter.

4. In a sanding or polishing machine in combination with a sanding or polishing belt, a work-table and means for moving it to carry the work transversely with respect to the operating ply of the belt; an elastically-flexible pressure-bar extending above said operating ply; means for carrying such pressure-bar comprising a multiplicity of connections thereto distributed at intervals along the length thereof, said connections being adapted individually and separately to yield elastically back from the work-table, and means

for positively forcing said connections individually and independently toward the table at will.

5. In a sanding or polishing machine in combination with a sanding or polishing belt and a work-table movable to carry the work transversely with respect to the travel of the operating ply of the belt; a pressure-bar extending above the belt; means for carrying such pressure-bar comprising a multiplicity of hangers and devices for raising and lowering them simultaneously; pressure-feet mounted in said hangers respectively and connected with the pressure-bar at intervals throughout the length thereof, and springs reacting between the pressure-feet and the hangers respectively to yieldingly resist the movement of the feet upward with respect to the hangers and to transmit yieldingly downward pressure from the hangers to the feet, said feet being separately accessible and movable in the hangers toward and from the work-table.

6. In a polishing or sanding machine in combination with a polishing or sanding belt and the work-table movable to carry the work transversely to the operating ply of the belt; an elastically-flexible pressure-bar extending above said operating ply and a multiplicity of pressure-feet distributed along the length of the pressure-bar above the same, each independently movable toward and from the work-table, said feet being extended at their bearing upon the pressure-bar obliquely across the same for substantially the purpose set forth.

7. In a polishing or sanding machine in combination with a polishing or sanding belt, a work-table movable to carry the work transversely to the travel of the operating ply of the belt; an elastically-flexible pressure-bar suspended above said ply; means for so suspending such pressure-bar comprising a pair of fixed shafts parallel with the pressure-bar; links connecting such shafts respectively with another pair of parallel shafts; hangers mounted on said last-mentioned pair of shafts constituting link connections between them and pressure-feet mounted for vertical reciprocation in said hangers and connected to the pressure-bar, and springs reacting between the pressure-feet and the hangers respectively to yieldingly transmit the downward pressure of the hangers to the feet and thereby to the pressure-bar, and means for depressing at will the second pair of shafts.

8. In a polishing or sanding machine in combination with a polishing or sanding belt, a work-table movable transversely with respect to the travel of the belt; a pressure-bar carried at the opposite side of the operating ply of the belt from the work-table; a multiplicity of presser-feet distributed at intervals along the pressure-bar at the opposite side of

said pressure-bar from the said ply of the belt; means for supporting said presser-feet with capacity for movement toward and from said ply and rock-shaft having journal-bearings fixed with respect to said supports and having tappets corresponding to the presser-feet respectively, said tappets being spaced on the rock-shaft at intervals different from the intervals between the corresponding presser-feet along the pressure-bar, said rock-shaft being longitudinally movable in its bearings to bring any selected tappet in position for action on its corresponding presser-foot.

9. In a sanding or polishing machine, in combination with a sanding or polishing belt, a work-table movable transversely with respect to the travel of the operating ply of the belt; an elastically-flexible pressure-bar supported at the opposite side of the operating ply of the belt from the work-table, and a multiplicity of presser-feet at the opposite side of the pressure-bar from said ply of the belt having their surfaces which bear upon said pressure-bar extending across the same in direction oblique to the movement of the work-table.

10. In a sanding-machine, in combination with a sanding or polishing belt, a table for supporting the work movable to carry the work transversely with respect to the travel of the operating ply of the belt; an elastically-flexible pressure-bar overhanging said operating ply; means for moving the pressure-bar bodily toward and from said ply; a multiplicity of presser-feet distributed at in-

tervals along the length of the pressure-bar at the opposite side thereof from said operating ply, the surfaces of said feet which bear upon the flexible pressure-bar extending across it in a direction oblique to the movement of the table, and means for thrusting said presser-feet individually and independently toward said ply.

11. In a sanding-machine, in combination with a table for supporting the work which is movable to carry the work past the sanding devices, such sanding devices and means for giving the same movement for rubbing the work; a pressure-bar at the opposite side of the sanding devices from the table, having a multiplicity of presser-feet extending across it in a direction oblique to the movement of the work-carrier.

12. In a sanding-machine, in combination with a sanding device and means for giving movement thereto for rubbing the work, a table for supporting the work which is movable to carry the work past the sanding device exposed thereto, in a direction transverse to the rubbing movement of the latter, and a pressure-bar at the opposite side of the sanding device from the work-table having a multiplicity of presser-feet extending across it in a direction oblique to the movement of the table.

In testimony whereof I have hereunto set my hand this 27th day of May, 1904.

EMIL TYDEN.

In presence of—

FRED G. FISCHER,
JULIA S. ABBOTT.