July 4, 1933. G. D. WELCH 1,916,543

PORTABLE SANDER TOOL

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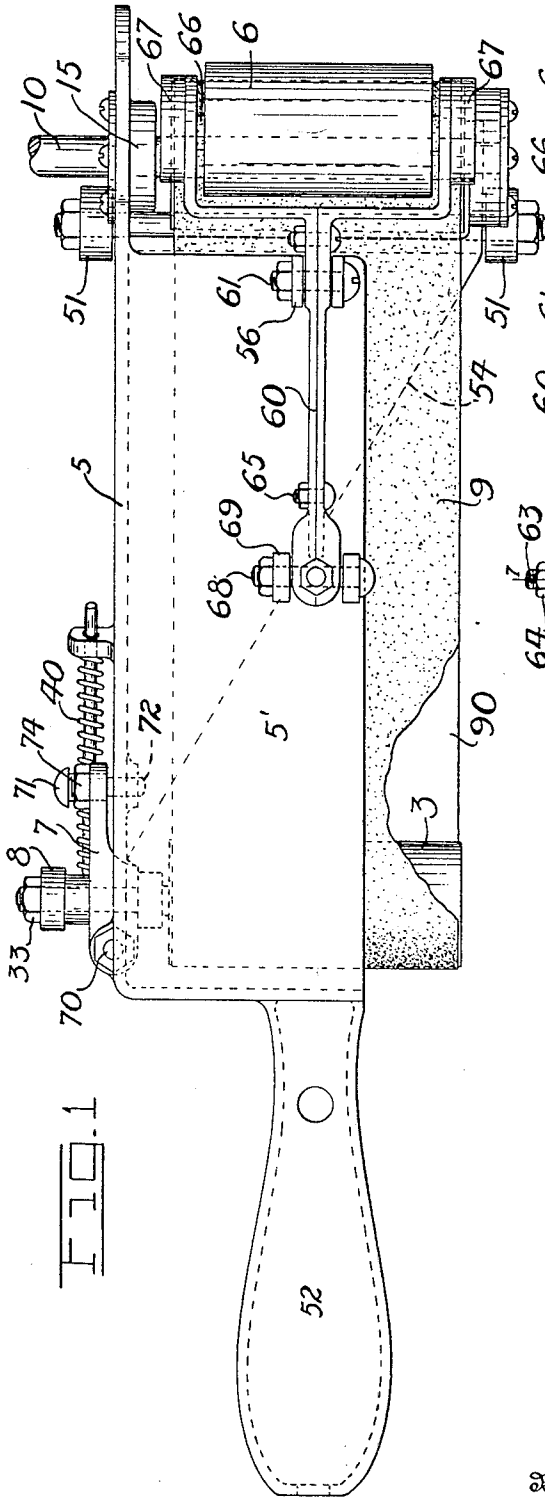


Fig. 1

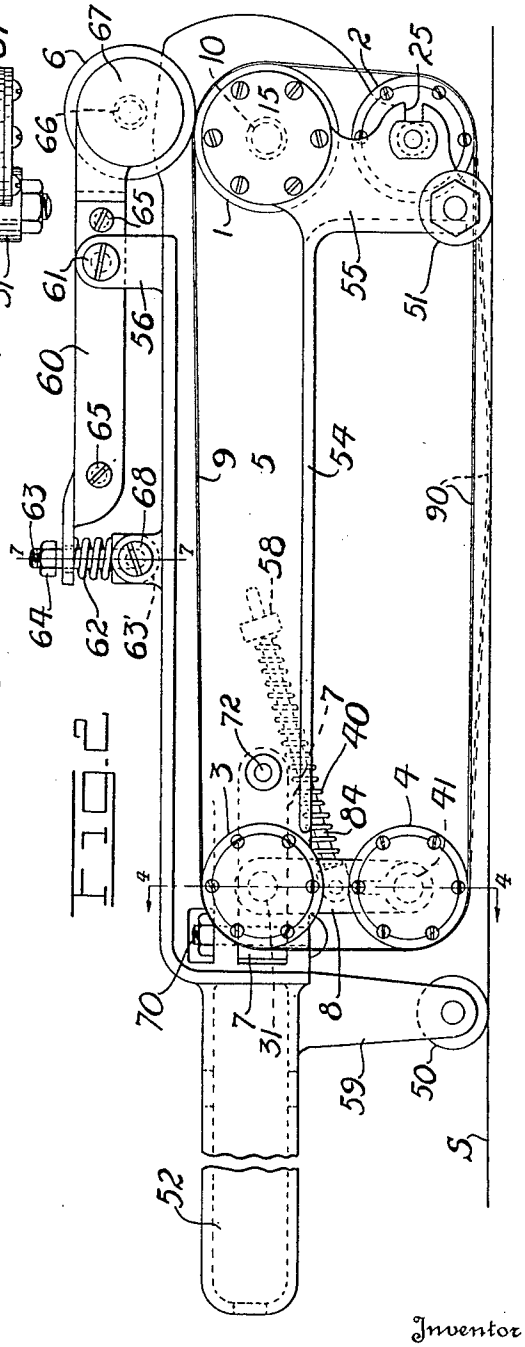


Fig. 2

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FIG. 3

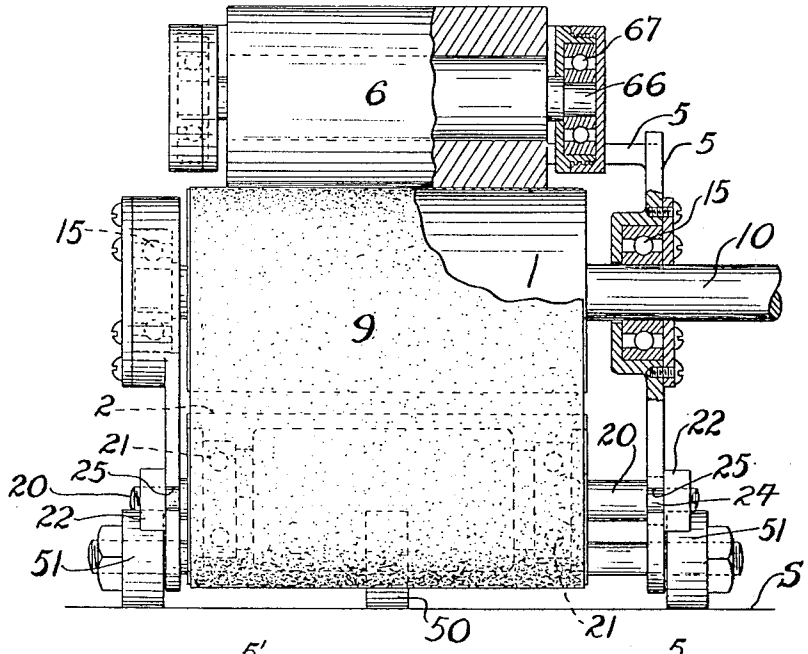
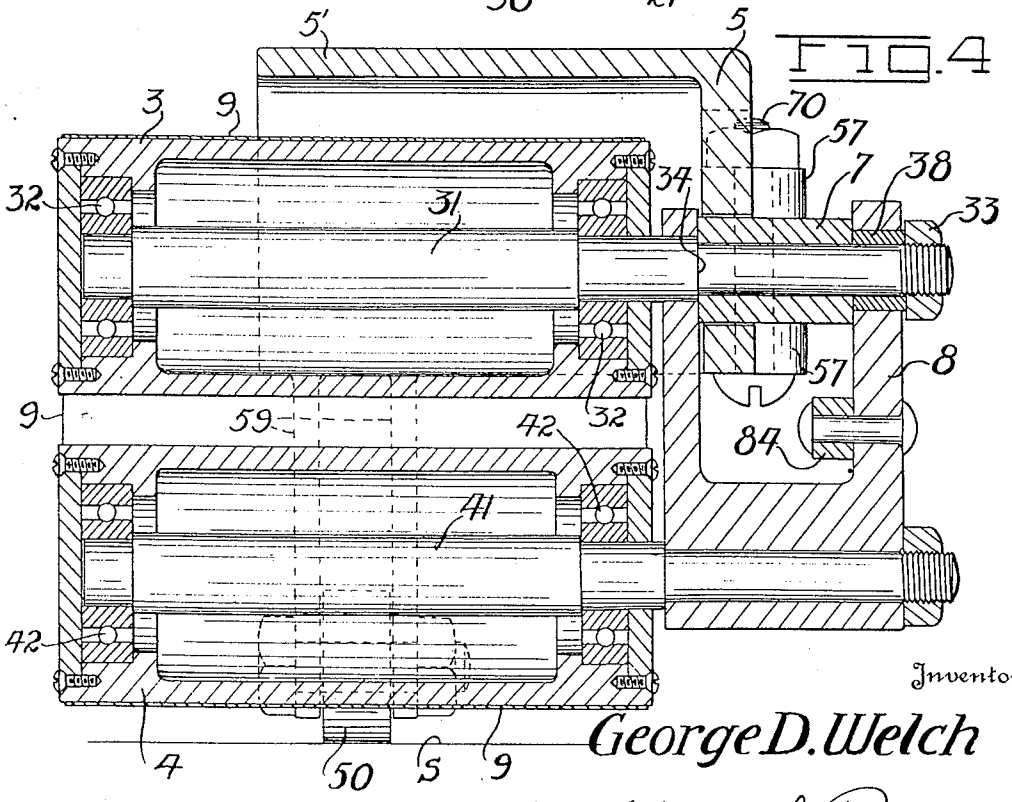


FIG. 4



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FIG. 5

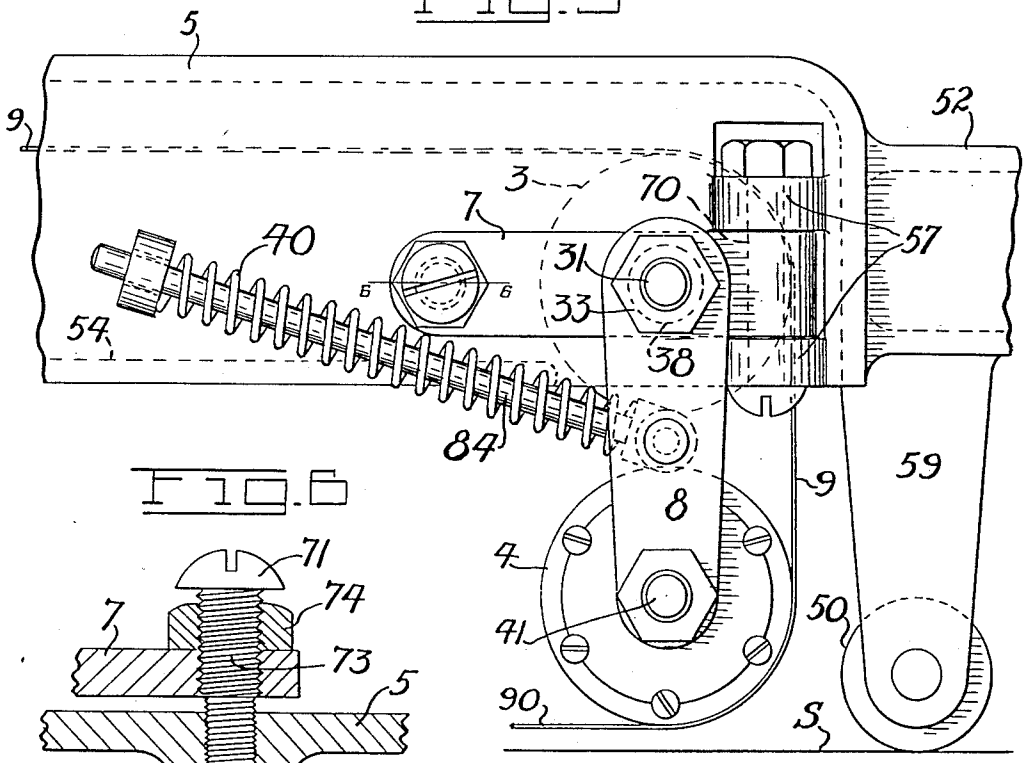


FIG. 6

FIG. 8

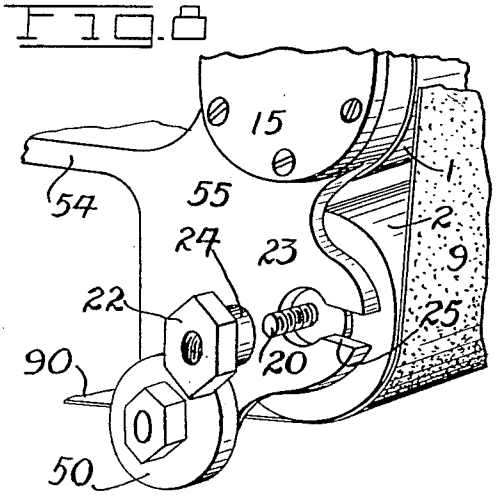
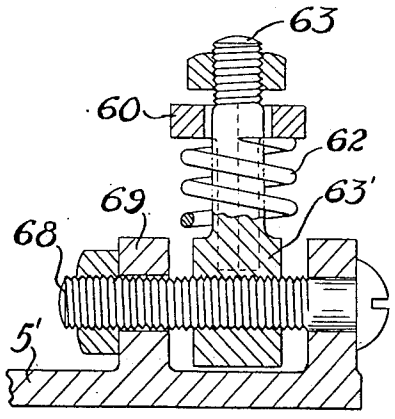


FIG. 7



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Patented July 4, 1933

1,916,543

UNITED STATES PATENT OFFICE

GEORGE D. WELCH, OF HOQUIAM, WASHINGTON

PORTABLE SANDER TOOL

Application filed June 18, 1930. Serial No. 461,907.

My invention relates to an improvement in a hand sanding tool, for use in any place where sanding or polishing belts may be used, and capable of use in many places where ordinary sanders cannot be used. It is useful for smoothing up spots on the surface of lumber, for sanding down automobiles in the process of finishing them, and for sanding or polishing flat or curved surfaces generally.

My general object is to provide a small, light, and easily handled tool, which may be moved about over a surface, even of considerable area, and so arranged that the workman may engage the inside of the lower run of the flexible sander belt with his hand whenever he wishes, to bring the sander belt into contact at the selected spot with the surface of the work.

It is an object to provide means whereby such a sander may be held with the belt normally out of contact with the work, but with means permitting yielding of the belt under pressure of the workman's hand, to permit its deflection into contact with the work.

It is a further object to provide such a tool wherein the sander belt is carried upon rollers from which it may be very simply removed over one end of the rollers. It is also an object to provide a means whereby the accidental removal of the sander belt from the rollers is prevented.

It is a further object to provide means to exactly align the several rollers, both the belt-carrying rollers, the tightener roller, and a pressure roller.

Other objects, and especially such as relate to the mechanical details of such a structure, will be ascertainable from a study of the following specification, of the attached drawings, which show my invention in a form at present preferred by me, and of the claims which terminate the specification.

Figure 1 is a plan view of the tool forming my invention, a part of the sander belt being broken away.

Figure 2 is a side elevation of the machine from the forward or outer side, that is the side from which the sander belt is removed.

Figure 3 is an end elevation of my device on a large scale, taken from the right, as seen in Figures 1 and 2.

Figure 4 is a transverse section through my device on the line 4—4 of Figure 2.

Figure 5 is a rear side elevation of one end of my tool.

Figure 6 is a detail section on the line 6—6 of Figure 5.

Figure 7 is a detail section on the line 7—7 of Figure 2.

Figure 8 is a detail perspective view of the mounting for one of the rollers.

Essentially, my device comprises an endless sander belt 9 passing about rollers 1, 2, 3 and 4, which are held in a frame 5, and one of these rollers, as the roller 4, is mounted to yield, as for instance against a spring 40, to permit deflection of the lower run 90 of the belt towards the work or to permit the belt to be slacked off to slip it off the ends of the several rollers for replacement. A pressure roller 6 may likewise be provided, bearing upon the outside of the sander belt 9 immediately above the driving roller, which may be the roller 1. To prevent unequal wear of the belt and a tendency to climb, as if the rollers were crowned, due to imperfect alignment or parallelism of the several rollers, means may be provided at one end, as will be explained, to align one pair of rollers (for instance the rollers 3 and 4) with the other pair of rollers, particularly with the driving roller 1. I prefer also that the entire tool be supported from the surface of the work, generally designated at S, upon rollers such as are indicated at 50 and 51, depending below the frame 5, the frame being governable by any convenient means such as the handle 52. The drive may be variously arranged, and an integral motor may be employed, or a flexible chain drive, or any suitable means. As typical of a means which may be employed, I have shown the drive shaft 10, on which is mounted the roller 1, journaled in the bearing 15, in the frame, and as projecting therebeyond for connection to a suitable source of power.

Of the rollers 1, 2, 3 and 4, the roller 1, being the driving roller, should be journaled in the frame 5, and its companion roller 2 of the same pair is preferably also journaled in the frame. To the latter end, the frame 5 at each end of the roller 2 may be notched, as indicated at 25, to permit a shaft 20, upon which the roller 2 is journaled in the bearings 21 (see Figure 3), the bottom of the notch 25 being enlarged as indicated at 23, to receive the circular extension 24 of a nut 22. By these or like means, the shaft 20 is retained, centered in the enlargement 23, yet upon slacking off the nuts 22 (the sander belt

having first been removed) the roller 2 may easily be slipped from the frame, withdrawing its shaft 20 through the slots 25. By such means, it may be held definitely and precisely in parallelism with the axis of the driving roller 1.

The roller 3 is paired with the roller 4, and to permit alignment, or the bringing of these two rollers into parallelism with the rollers 1 and 2, particularly the roller 1, they are carried by anti-friction bearings 32 and 42 upon the respective shafts 31 and 41, which shafts are supported from a longitudinally extending lever 7. This lever is pivoted upon the frame by means of a bolt 70 passing through ears 57 and through the end of the lever 7. Adjustment or transverse swinging of the lever 7 is accomplished by means such as the differential screw 71 (see Figure 6). A portion 72 of slight pitch is threaded in the frame 5 and a portion 73 of greater pitch is threaded in the swinging end of the lever 7. The adjustment which is finally attained by this screw 71 is held by such means as the lock nut 74.

The two shafts 31 and 41 are not each received directly in the lever 7. Only the shaft 31 is so held, and the shaft 41, carrying the tightener roller 4, is secured in the swinging end of an arm 8, which is mounted to swing on the shaft 31. The position of the arm 8 is controlled by means of a rod 84 passing through a lug 58 in the frame 5, and about which rod the tightener spring 40 is coiled. It will be noted that the arm 8 is swung free, and the shaft 31 is clamped and held in the lever 7 by means of a nut 33, clamping the lever 7 through the intermediary of a spacer collar 38, whereby the nut 33 can force against a shoulder 34 on the shaft 31. Adjustment of the lever 7 will adjust the angular position of the two shafts 31 and 41, although the shaft 41, with its tightener roller 4, is still free to swing about the axis of the shaft 31 by means of its mounting on the arm 8, and the influence of the spring 40 thereon.

It will be noted that the frame 5 is disposed largely at the rear side of the tool, although it has an upper member 5′ covering substantially the top run of the sander belt. The several shafts 10, 20, 31 and 41, are all supported from their rear ends, although the shafts 10 and 20 are likewise supported at their forward ends; the shafts 31 and 41 are not. To support the forward ends of the shafts 10 and 20, there is provided a forward extension 55 of the frame 5, which extension is supported from the main frame 5 by means of a web 54, which projects between the upper and lower runs of the sander belt 9, but sufficiently above the lower run 90 to permit insertion of the workman's hand therebetween to engage the belt. The frame is omitted therefore below the web 54, which is spaced above the lower run of the sander belt.

The wheels 51 are secured directly upon the frame 5 and the extension 55, and the wheel 50 may be mounted in a depending leg 59, and thus supported, the frame may be moved over the surface S until it is brought into position over a spot which is to be sanded, whereupon the workman, placing a hand between the web 54 and the lower run 90 of the sander belt, presses down on the sander belt, which causes deflection of the tightener roller 4 in opposition to the spring 40, to bring the sander belt down upon the work, as has been indicated in dotted lines in Figure 2.

It will be noted that the rollers 1, 2, 3 and 4 are free at their outer or forward ends, and that the frame extension 55 does not project outside of an extension of the plane of the sander belt 9, so that there is no obstruction to removal of the sander belt other than the tension on the spring 40 and, in the illustration shown, the outer wheel 51. However, when it is desired to change sander belts, it is easily possible to swing the tightener roller 4 inward enough to provide slack in the belt 90, such as will permit it to pass over the wheel 51, and thus to be removed without dismounting any part of the sander. This wheel 51, while the sander is in operation, serves as a positive means to prevent the sander belt slipping off the rollers.

To assist the driving roller 1, I prefer that a pressure roller 6, previously referred to, be employed, and this is preferably of rubber. It is mounted on one end of a lever 60, pivoted upon ears 56, projecting upward from the top portion or table 5′. The lever 60 is engaged at its end opposite that which carries the roller 6 by a spring 62 coiled about a pin 63, having a stop such as a nut 64. The spring 62 exerts pressure to force the roller 6 down into engagement with the sander belt 9, running between the pressure roller 6 and the driving roller 1.

It will be noted that the lever 60 is formed in two halves, secured together by the bolts 65, and to replace the roller 6, it is only necessary to dismount the lever 60 and to remove the bolts 65, whereupon the two halves of the lever 60 may be separated, the shaft 66 being releasable from the anti-friction bearings 67, to permit the insertion of a new roller.

Such a roller is preferably made of or faced with rubber, and unless it is in exact parallelism with the axis of the roller 1, an excessive amount of abrasion will occur and the roller will be quickly worn out. To exactly align it, therefore, I have provided the bolt 68 received in the ear 69 of the frame, which bolt is threaded in the head 63′ of the pin 63, whereby the same may be adjusted transversely of the tool to attain precise alignment of the rollers 6 and 1.

What I claim as my invention is:

1. In combination with a sander belt, longitudinally spaced idling and driving rollers carrying the belt, a frame from which said rollers are supported, two of the idling rollers at one end of the frame comprising a pair, means for aligning the idling pair with the driving roller, at the opposite end, and means for yieldably supporting one roller of the pair to permit its movement towards the driving roller when the sander belt is deflected.

2. In combination with a sander belt, longitudinally spaced idling and driving rollers carrying the belt, a frame from which said rollers are supported, and capable of being moved over the work, a pressure roller bearing upon the belt over the driving roller, and means for aligning said pressure roller with the driving roller.

3. In combination with a sander belt, longitudinally spaced pairs of rollers, including a driving roller, carrying said belt, a frame from which the several rollers are supported, a pressure roller engageable with the sander belt above the driving roller, a lever pivoted upon the frame and carrying the pressure roller, and means for swinging said lever transversely to bring the axis of the pressure roller into parallelism with the driving roller.

4. The combination of claim 3, the lever being split and the two halves removably secured together to retain the roller.

5. The combination of claim 3, the lever swinging means including a vertical headed pin engaging the lever, a spring between the head of said pin and the lever, and a transverse screw threaded in the head of said pin, and swiveled in the frame.

6. In combination with a sander belt, longitudinally spaced pairs of rollers, including a driving roller, carrying said belt, a frame supporting said rollers, wheels depending below the frame to support the belt above the work, tightening means permitting movement of one of said rollers parallel to its axis to allow deflection of the belt into contact with the work, a front supporting member, a horizontal web of said frame extending between the upper and lower runs of said belt to support said front member, said web being cut out so as to permit access to the lower run of the belt by the workman's hand.

7. In combination with a sander belt, longitudinally spaced pairs of rollers, including a driving roller, carrying said belt, and a frame extending at the rear side of the rollers, and including a support at the front side of one pair of rollers only, and substantially within the projected planes of the belt, and connected to the frame in the rear only by an integral web extending between the runs of the belt, one pair of rollers being supported between the front and rear elements of the frame, and a member pivotally mounted on a vertical axis, and supporting the other pair.

8. In combination with a sander belt, a unitary frame movable over the work, a pair of parallel rollers disposed one above the other, means supporting said rollers upon the frame, means for relatively adjusting said rollers to lie in a common vertical plane, a second pair of rollers and a support therefor carried by said frame, means for relatively adjusting the rollers of said second pair upon their support to lie in a common vertical plane, and independently adjustable means adapted to arrange the roller pairs so that their planes are disposed in parallel spaced relationship, the sander belt being carried by said rollers.

9. In combination with a sander belt, a unitary frame movable over the work, longitudinally spaced rollers supported from said frame and carrying the belt, said rollers being arranged in pairs at each end of the frame, and means to align the rollers at opposite ends, disposed and arranged to align one pair of rollers with the opposite pair.

10. In combination with a sander belt, longitudinally spaced rollers supporting said belt to form an upper and a lower run, and a frame supporting said rollers, and comprising three integral parts, the first being a plate extending perpendicular to the rollers at one end thereof, the second being a web extending perpendicular to said first part between the runs of the sander belt, the third being a plate supported by said web and extending parallel to said first plate over the rollers at one end only of the frame, and substantially within the projected planes of the belt.

11. The combination of claim 10 and a plate connected to the frame extending perpendicular to the first-mentioned plate and overlying the upper run of the sander belt.

12. In combination with a sander belt, a frame, a roller directly supported upon said frame, a lever pivoted upon the frame upon a vertical axis, a transverse roller-carrying shaft secured in said lever, means to adjust said lever to bring the shaft into parallelism with the axis of the frame-supported roller, an arm mounted to swing upon said shaft, a second transverse roller-carrying shaft carried by said arm, the belt being carried upon said rollers, and means for urging said arm and the roller carried thereby against the belt to tighten the belt.

Signed at Hoquiam, Grays Harbor County, Washington, this 10th day of June, 1930.

GEORGE D. WELCH.