

Jan. 22, 1929.

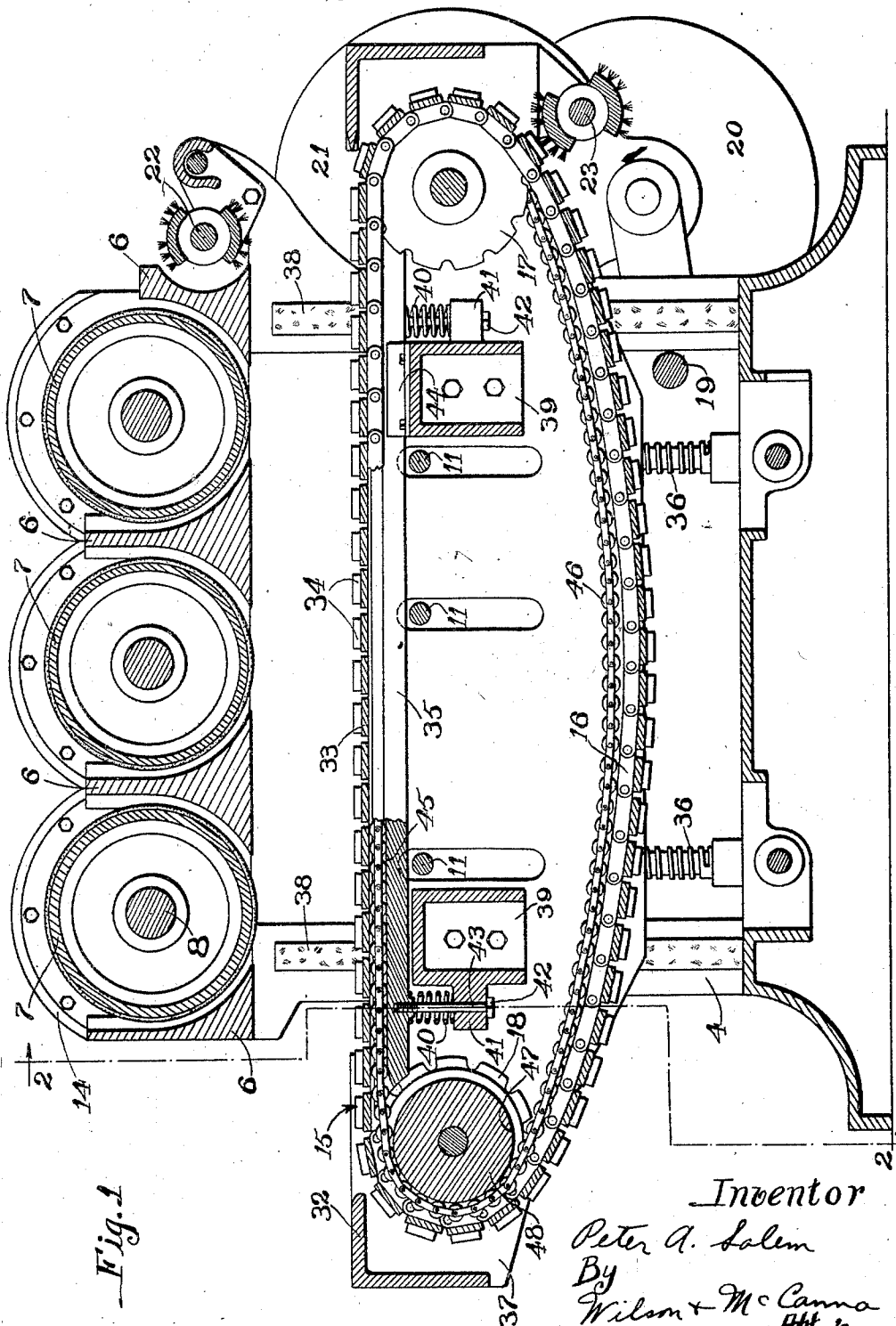
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ENDLESS BED SANDER

Original Filed Dec. 31, 1925

2 Sheets-Sheet 1



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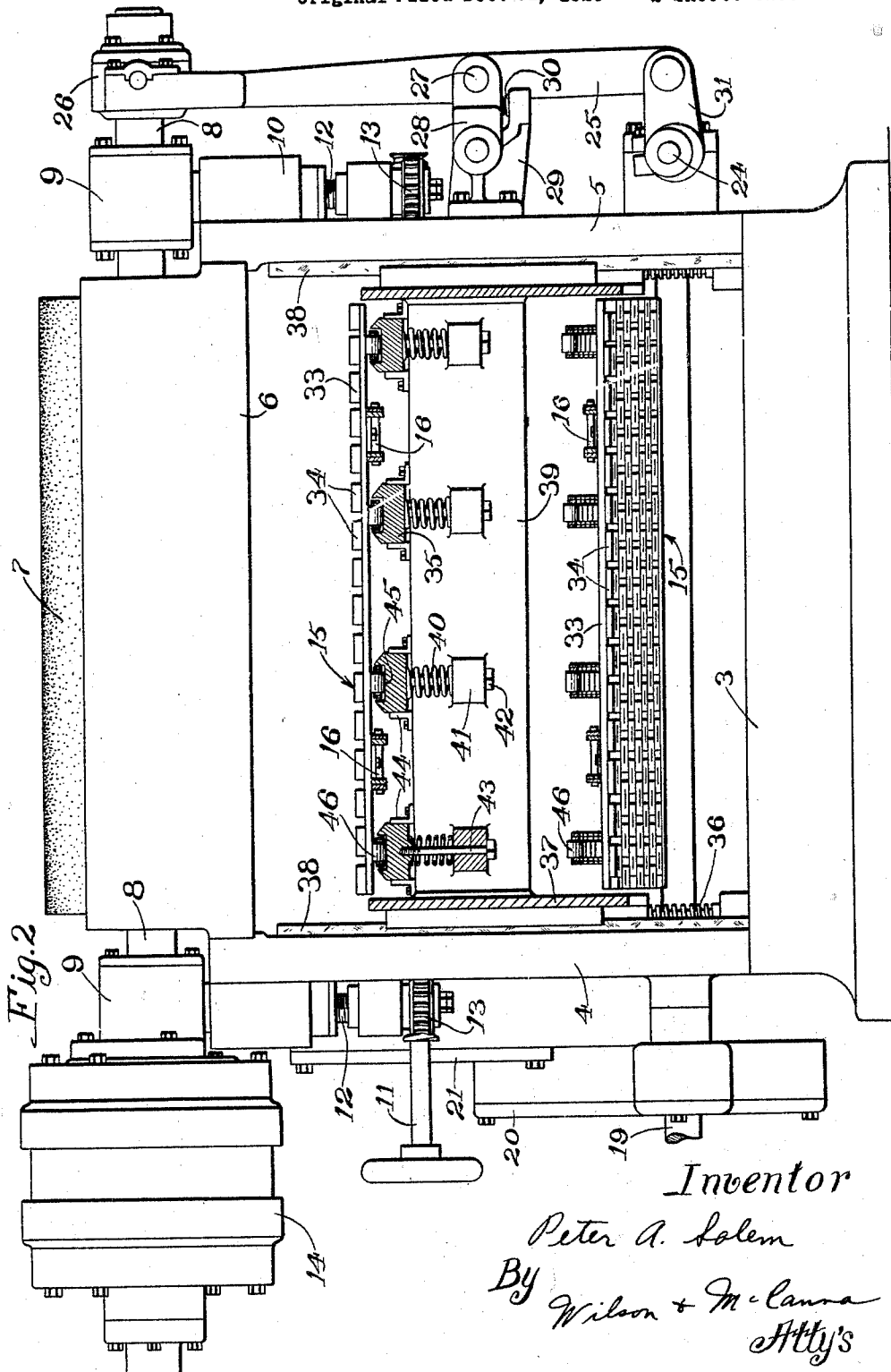
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2 Sheets-Sheet 2



UNITED STATES PATENT OFFICE.

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ENDLESS-BED SANDER.

Original application filed December 31, 1925, Serial No. 78,512. Divided and this application filed January 3, 1928. Serial No. 244,111.

This application is a division of my co-pending application Serial No. 78,512, filed December 31, 1925.

This invention has particular reference to conveyors although shown applied to sanding machines of the endless bed type which usually employ rotating sanding or abrading drums or cylinders.

In machines of the kind referred to, the endless bed serves to feed the work to the abrading drums and for this purpose has been provided with resilient pads to secure the necessary traction with the work. The endless bed was heretofore made to travel in direct contact with bed rails which afforded serious resistance to the feeding of the bed due to the friction resulting from the pressure of the work on the bed. As a result, considerable power was consumed in the feeding of the work. It is therefore the principal object of the present invention to provide anti-friction bearings for the endless bed on the bed rails in the form of endless roller bearing chains which are independent of any connection with the feed bed or bed rails and are arranged to travel on the bed rails between the latter and the feed bed.

The purport of the invention will appear in the course of the following detailed description in which reference is made to the accompanying drawings, wherein—

Figure 1 is a longitudinal vertical section through a sander embodying my invention: and

Figure 2 is an end view of the machine with a portion appearing in transverse vertical section on the line 2—2 of Figure 1, looking in the direction of the arrows.

The same reference numerals are applied to corresponding parts in both views.

In sanding machines of the kind mentioned, a heavy base 3 is usually provided having rather heavy upright side frame pieces 4 and 5 extending therefrom and suitably fixed together in spaced relation. The frame pieces carry pressure bars 6 having smooth under faces for the passage therebeneath of the stock operated upon. The pressure bars are arranged on opposite sides and between abrading drums 7 mounted on shafts 8 received in bearings 9 arranged for vertical adjustment in bosses 10 on the outside of the frame pieces 4 and 5. The drums are individually adjustable as to elevation by hand

wheels on the shafts 11 which operate jack screws 12 through the worm and gear connections shown at 13. The drums are driven individually by motors 14 which are controlled singly or collectively to give a one, two or three drum machine, as desired, and so as to permit any one or more or all of the motors being started or stopped when required. Work is fed to the drums by an endless feed bed 15 which will be described more fully hereinafter. It will suffice at this point to state that the bed comprises a sprocket chain 16 meshing with a drive sprocket 17 and an idler sprocket 18 at opposite ends of the machine. The sprocket 17 is driven from a main power shaft 19 through suitable transmission in the housings 20 and 21, the shaft 19 being coupled to or otherwise suitably driven by a motor supported on a bracket at the side of the machine. The shaft is shown broken away and the motor referred to is not shown. Besides operating the bed, the shaft 19 has a belt connection (not shown) for driving the brushes 22 and 23 and has a gearing connection (not shown) for driving a shaft 24 for operating the rocker arms or beams 25. The brush 22 cleans the stock passing out of the machine and the brush 23 keeps the endless bed clean. The rocker arms 25 communicate an oscillating or reciprocatory motion to the drums 7 through the thrust bearing connections 26 with the shafts 8. Each of the rocker arms 25 is pivoted intermediate the ends thereof, as shown at 27, on a link 28 pivoted to a bracket 29 fastened to the outside of the frame piece 5 and a counter balancing compression spring 30 acting between the bracket 29 and the link 28 serves to keep the rocker arm in floating relation to the projecting end of the shaft 8 so that no weight is imposed thereon. This is with a view to avoiding the deflection of the projecting end of the shaft to eliminate any whipping action and consequent deflection. The shaft 24 has eccentrics thereon for rocking the arms 25 through link connections 31 at the lower ends of the rocker arms. Usually the first drum of the set is given simple rotation for the initial rough finishing cut on the work. In the present case, the work entered in the machine over the table 32 is roughed off by the first drum it encounters. The other two drums oscillate transversely while rotating and in this way produce a very smooth

surface on the work, it having been found that without oscillating motion the fibres of the wood are drawn or strung out and are left in a loose fuzz on the surface of the stock.

5 For the most part the arrangement just described is commonly employed in endless bed sanders and no invention is claimed therein except only in so far as the details referred to cooperate with the features to be described hereinafter.

10 The endless feed bed 15 comprises a plurality of transverse steel slats 33 upon which traction pads 34 of reinforced rubber are secured. Each slat 33 is fastened to a link 15 of the heavy steel sprocket chain 16 and while a single sprocket chain may be employed, I prefer to provide two chains near opposite sides of the bed as shown in Fig. 2. The bed travels beneath the drums over rails 35 extending longitudinally in the machine. Four rails are preferably provided with the sprocket chains operating therebetween. The rails 35 support the bed normally in a definite spaced relation to the drums as determined by the adjustment of the jack screws 25 36 which raise and lower the bed and rails with the carriage 37. The latter operates on vertical ways 38 provided on the inside of the frame pieces 4 and 5. The fixed, spaced relation of the bed to the drums determines of course the depth of cut to be made by the machine. Cross beams 39 at opposite ends of the rails 35 on compression springs 40. The 35 latter act between the rails 35 and lugs 41 on the beams 39 and are held in place by bolts 42 which operate and are guided for vertical movement in holes 43 provided in the lugs 41. The construction described provides a yielding support for the endless feed bed which 40 though normally serving as a rigid support to keep the bed in a definite spaced relation to the drums will, nevertheless, yield in the event of excessive pressure brought to bear 15 by the work on the bed in case too large a piece of work is fed into the machine, or in the event the work is of such an irregular character as would cause a jam. It frequently occurs that an inexperienced operator or 50 one who is careless or ignorant will attempt to feed work through the machine for which it is not set properly and the breakage of gears in the transmission for driving the feed bed or the destruction of other parts will follow where no safety provision is made as 55 in the present case. The slats 33 are sufficiently flexible to be bowed in the event a high spot on the work should occur that would tend to cause a giving of the feed bed support at one point to avoid jamming. The 60 spacing laterally of the yieldable supports will permit any one or more bed rails to give individually to take care of the circumstance mentioned. The yielding bed construction is 65 covered in the parent application above re-

ferred to. The anti-friction bearing chains, forming the subject matter of this application will now be described.

The bed rails 35 are held against lateral displacement and have vertical movement between angle irons 44 bolted on top of the cross beams 39. The tops of the rails 35 are channeled to provide tracks 45 extending lengthwise of the machine for the reception of anti-friction rollers 46. The latter are linked together in endless chains received in grooves 70 47 in the periphery of drums 48 mounted on the same shafts with the sprockets 17 and 18 and between the latter. The chains are absolutely independent of any operating connection with either the feed bed or the bed rails. Hence in their travel along the bed rails between the latter and the feed bed the chains 75 will travel in the same direction as the feed bed but at a slower speed. As a matter of fact these chains will travel at approximately half the speed of the feed bed. The space 80 between centers of adjacent rollers in the chain is less than the width of any slat of the endless feed bed so as to insure the location of at least two or more rollers under each slat in the operation of the feed bed. This 85 makes for very smooth and easy running and the load imposed on the motor for feeding the work is of course substantially reduced and the machine is more economical to operate. The elimination of friction between the 90 feed bed and the bed rails avoids communication of an endwise thrust on the bed rails and enables the yielding bed construction as 95 above described.

It is believed that the foregoing description conveys a clear understanding of my invention and of the numerous advantages derived therefrom. It should be apparent that 105 while I have shown my invention as embodied in an endless bed sander the type of conveyor shown might be utilized for other purposes or on different kinds of machines. All equivalent embodiments are therefore to be construed as covered by the appended claims. 110

1 claim:

1. A conveyor structure of the character described comprising a frame, an endless feed bed mounted on said frame, a plurality of 115 bed rails extending longitudinally relative to the bed beneath the one lap thereof for the latter to operate upon, and a plurality of endless linked chains of rollers operating within the endless feed bed and arranged to travel along said bed rails between the latter and the feed bed, the said chains of rollers being independent of any connection with 120 either the feed bed or the rails and being arranged to travel in the same direction as the feed bed but at a slower speed.

2. In a structure as set forth in claim 1 wherein sprockets are provided on which the endless feed bed is arranged to operate, the provision of drums mounted coaxially with 130

said sprockets and extending crosswise relative to the ends of the bed rails, said drums having annular grooves in the periphery thereof for the reception of the endless linked chains of rollers.

3. In a structure as set forth in claim 1 wherein the endless feed bed is made up of hingedly connected cross slats, the provision of the endless linked roller chains having the links thereof of such length that the distance between the centers of adjacent rollers is less than the width of any slat for the purpose described.

4. A structure as set forth in claim 1 wherein the bed rails are grooved longitudinally to provide tracks for the reception of said chains, the grooves being of such depth that the rollers when received therein project substantially above the plane of the top of the rails.

5. A structure as set forth in claim 1 wherein the bed rails are yieldingly supported and placed at the edges of the bed and also on an intermediate line or lines, and wherein the endless feed bed is made up of hingedly con-

nected cross slats supported by said bed rails and of such relatively yieldable resilient material as to bend between the rails under a force less than that necessary to deflect the adjacent rail whereby the slats are arranged individually to yield at any given point without general distortion throughout the width of the bed.

6. A conveyor comprising in combination a supporting frame, an endless conveyor belt mounted for operation on said frame, one or more bed rails supported on said frame beneath one lap of said belt to support the same for operation, said rails being arranged extending in the line of travel of said belt, and one or more endless linked chains of rollers arranged inside the endless conveyor belt to travel along the bed rails between the latter and the belt, said roller chains being independent of any positive operating connection with either the bed rails or the belt substantially as and for the purpose described.

In witness of the foregoing I affix my signature.

PETER A. SOLEM.