March 5, 1929. L. E. BLOOD 1,704,677

FEED MECHANISM FOR MOLDERS AND THE LIKE

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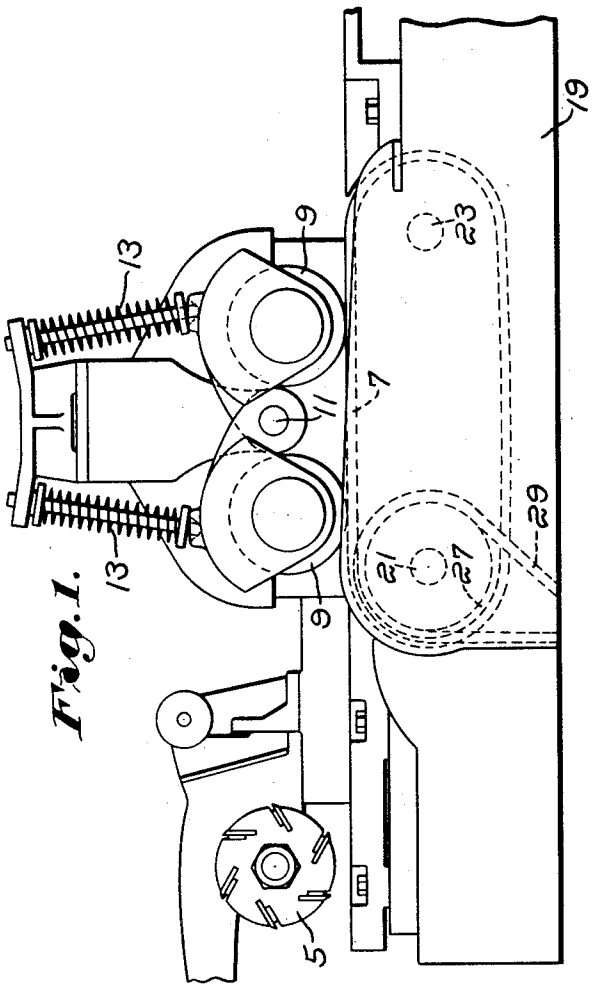

Fig. 1.

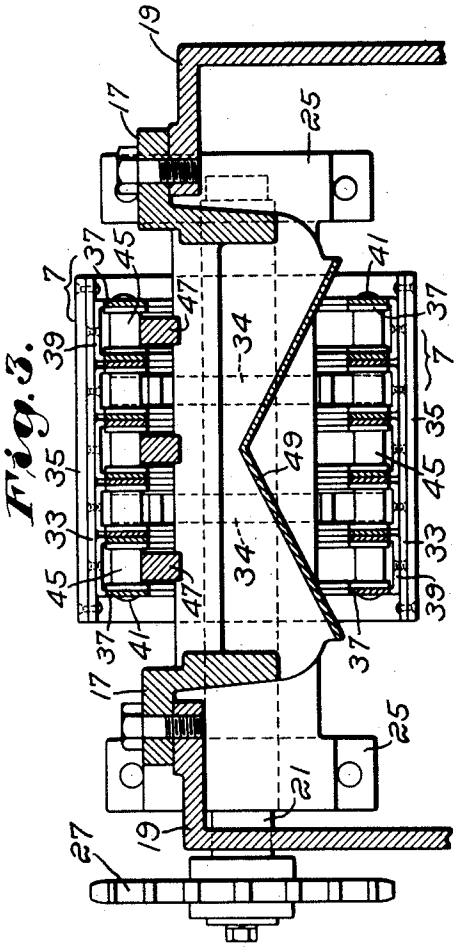

Fig. 3.

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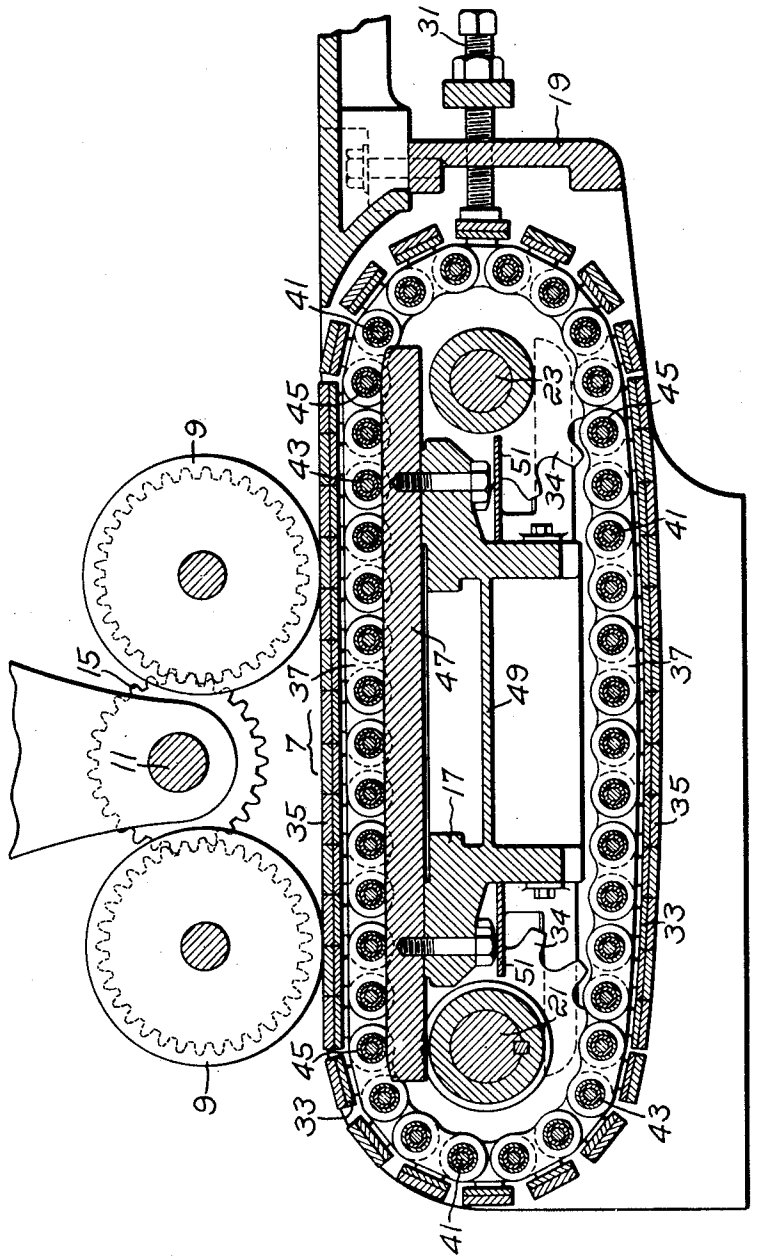

Fig. 2.

Fig. 4.

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Patented Mar. 5, 1929. 1,704,677

UNITED STATES PATENT OFFICE.

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FEED MECHANISM FOR MOLDERS AND THE LIKE.

Application filed January 23, 1928. Serial No. 248,636.

This invention relates to a feeding mechanism for a woodworking machine such as a molder, planer, matcher or the like, all of which may be designated generically by the term "planer" and the object is to provide an improved kind of feeding mechanism by the use of which will be obviated difficulties experienced with the feeding mechanisms hitherto customarily used.

My invention will be well understood by reference to the following description of the single illustrative embodiment thereof shown by way of example in the accompanying drawings, wherein:

Fig. 1 is a partial side elevation of a molder embodying in its construction a feeding mechanism illustrative of my invention;

Fig. 2 is a longitudinal section through the feeding mechanism, cooperating mechanism being shown in a simplified manner;

Fig. 3 is a transverse section through the feeding mechanism; and

Fig. 4 is an end elevation on an enlarged scale of a lag facing plate.

In molders and like woodworking machines it has hitherto been customary to advance the wood to the rotating cutter heads by means of pairs of cooperating feed rollers. Since such rollers make line contact only with the stock they are not as efficient as might be desired and their pressure on the stock sometimes impairs it in such manner as to cause breakage or damage when it reaches the cutters. Difficulty is also encountered in the case of stock which was not straight. In accordance with my invention I provide in such a machine a travelling bed which provides for the stock a uniform underriding support of considerable length, suitable cooperating pressure means being provided to hold the work to the bed so that the latter will feed it forward through the machine.

Referring to Fig. 1, I have there shown a first cutter head 5 of a molder to which the work passes as fed forwardly and over the endless circulating bed 7, the work being pressed into feeding relation to the bed by suitable cooperating pressure means, herein illustrated as rolls 9. The construction of these rolls as here illustrated is not in itself new apart from the combination in which they appear. Briefly, they may be mounted upon arms swinging about the center 11 and pressed to the work by means of springs 13. The rolls 9 are preferably driven as indicated in Fig. 2 by the disclosure therein of gearing including a driving gear 15 rotating about the center 11. This arrangement permits the rolls to swing about that center with the gearing constantly in mesh.

Referring now to Figs. 2 and 3, the travelling bed 7 may be organized as a unit on a sub-frame 17 provided with flanges whereby it may be bolted in position on the adjacent frame elements 19 of the complete machine. At opposite ends of the frame 17 there may be provided bearings for the transverse shafts 21 and 23. The bearing housings 25 for the forward shaft 21 appear in Fig. 3 and this shaft may be the driven shaft and carries a driving sprocket 27 adapted to be driven by the chain 29 (Fig. 1). The bearings for the rear shaft 23 may be longitudinally adjustable, as by means of the adjusting screws 31 (Fig. 2).

The travelling bed 7 may consist of a series of narrow, transversely disposed strips or lags 33 linked together in the form of an endless chain, travelling preferably in the manner hereinafter described, by suitable sprockets 34 on the shafts 21 and 23. As best shown in Fig. 2, in the upper rim of the chain the lags lie close together providing a uniform, flat surface without major projections on which the work rests for a substantial distance and against which it is pressed in firm frictional gripping relation by the pressure rolls 9. The lags 33 may conveniently be provided with renewable face plates 35 riveted thereto at their ends and, as illustrated in Fig. 4, the faces of these plates may be transversely ribbed or otherwise roughened to provide a suitable frictional gripping surface although, considered as a whole, the surface is uniform and relatively smooth, or, as I have expressed it, without major projections. That is, the work rests flatly thereagainst and its driven engagement with the work is a frictional one. On account of the small scale I have not attempted to show the ribs in Fig. 2.

To secure the lags together in the form of

a chain pairs of vertically disposed links 37 may be provided having flange portions 39 to which the lags may be riveted, the pairs of links on alternate lags being received between those on the adjacent lags and the links being suitably pivoted together at the joints between the lags, as by means of the headed-over pintles 41 passing through sleeves 43 received in the inner pairs of links, which sleeves carry rollers 45, the successive pairs of links thus forming a chain. The number of these chains will vary with the width of the bed, five being shown in the present instance in Fig. 3. One or more of the longitudinal series of rollers are adapted to engage the sprockets 35 so that the forward sprocket on the driving shaft 21 will drive the circulating bed, the upper run thereof on which the work rests being advanced under tension in the operation of the machine. I have herein shown two driving sprockets 34 disposed symmetrically with respect to the center line, and the drive irrespective of the number of sprockets should preferably be so organized as to exert its advancing force in the balanced manner with respect to the longitudinal center line of the bed. That is, a single sprocket should be at the center line or a plurality of sprockets symmetrically arranged with respect thereto.

Rollers of other longitudinal series of links may be utilized to provide an antifrictional support for the upper run of the travelling bed so as to maintain the same rigidly in a horizontal plane, as seen in Fig. 2, and for this purpose longitudinal rails 47 may be provided on the sub-frame 17 on which these rollers 45 travel in the manner of wheels. In the present example of the invention wherein there are five longitudinal series of rollers three rails 47 are utilized alternating with the sprockets 34 and supporting the central series of rollers and the two outer series. The support given should preferably be symmetrically applied and should embody supporting means adjacent the lateral ends of the lags to prevent any tipping or tilting of the same.

Referring to Fig. 2, it will be seen that the rollers 45 are disposed at the joints between successive lags and alternate with the same so that each lag travels on the rails, as it were, on a little carriage or truck having front and rear wheels supporting the same, when the lag forms a part of the travelling bed of the machine, firmly in a horizontal position without any tendency or opportunity for fore and aft tipping. The provision of the supporting rolls adjacent the ends of the lags, as already described prevents any tilting of the same in a plane transverse of the machine. By reference to Figs. 2 and 3 it will be seen that portions of the links 39 may extend below the rollers 45 and oppose the vertical faces of the rails 47, constituting, as it were, flanges which obviously will resist any tendency of the bed as a whole to become displaced laterally from the position shown in Fig. 3.

As best seen from Fig. 2, the flat horizontal supporting surfaces of the rails 47 are preferably continued to the center line of the sprockets 34, particularly the center line of the sprocket at the feeding out end of the mechanism adjacent the cutter head 5. As the roller which engages the teeth of the sprocket passes this center line, it begins to descend and the velocity of the lag to which it is connected begins to change, as is indicated by the spaces opening up between the lags as they pass around the side of the sprocket, and therefore the location of this center line is the termination of the straight-away length of the upper rim of the endless series of lags and the furthermost distance forward in the machine at which the aligned rollers moving on rails 47 may be supported in the fixed horizontal feeding plane desired.

The pressure rollers 9 which cooperate with the bed are preferably driven and it in any case is desirable that the left hand roller 9, viewing Fig. 2, be placed as near to the feeding-out end of the bed and as close to the cutter head 5 as may be reasonably effected to maintain a positive driven pressure on the work as long as possible. The arrangement shown, wherein the upper run of the bed is supported to the center line of the forward driving sprocket on shaft 21 permits this roller to be advanced very far forward. Viewing Fig. 2 and considering the roll which is immediately over the center line of the sprocket, as it passes this position the lag immediately to the rear of it begins to slope forwardly. Therefore, the rear edge of this lag, the lag at the left of the horizontal series in Fig. 2, represents the furthermost point forward where the horizontal length of the upper run of the series of lags is continuously maintained, this being a point one pitch to the rear of the center line. The roll 9 is therefore disposed to make contact with the bed approximately at this distance behind the center line. Thus in practice if the pitch of the sprocket is an inch and a half, the line of contact may be taken as at two inches to the rear of the center line. It will be noted in Fig. 2 that the line of contact appears further to the rear than it would be in the actual operation of the machine because no work is shown as interposed between the bed and the roll 9 and consequently the roll 9, swinging counterclockwise about the center 11, has moved slightly to the right in the figure.

The cross members of the sub-frame 17 may have cast therewith the roof-like web 49 adapted to cover and protect from falling dirt, chips and the like the lower run of

the travelling bed, and sheet metal members 51 may be attached to these cross members extending this protection over the end portions of the chain and the shafts 21 and 23.

I am aware that the invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof, and I therefore desire the present embodiment to be considered in all respects as illustrative and not restrictive; reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

Claims—

1. In a wood planing machine the feed mechanism comprising, in combination with cooperating feeding and pressure means, a circulating bed comprising an endless series of lags, sets of rollers at the joints between the lags, means connecting the lags and supporting the rollers, lateral rails for supporting the upper run of the bed on which certain series of said rollers run, sprockets engaging another series of rollers and means for driving the bed through one or more of the sprockets.

2. In a wood planing machine the feed mechanism for advancing work to a remote point of operation of planing knives comprising, in combination, the uniform bed formed by an endless series of lags, means to drive the same comprising a sprocket at the forward end thereof for advancing the upper run of the series under tension, rigid supporting means for said run extending substantially to the center line of the sprocket and cooperating pressure means opposing said bed substantially at the feeding-out end of its straightaway length for pressing the stock thereagainst to be frictionally advanced thereby.

3. In a wood planing machine the feed mechanism for advancing work to a remote point of operation of planing knives comprising, in combination, the uniform bed formed by an endless series of lags, means to drive the same comprising a sprocket at the forward end thereof for advancing the upper run of the series under tension, rigid supporting means for said run extending substantially to the center line of the sprocket, rollers through which said lags are supported from said means and cooperating pressure means opposing said bed substantially at the feeding-out end of its straightaway length for pressing the stock thereagainst to be frictionally advanced thereby.

4. In a wood planing machine the feed mechanism for advancing work to a remote point of operation of planing knives comprising an endless chain of transverse lags, rotary means for supporting and driving said chain, means adjacent the extremities of the lags for rigidly supporting the upper run thereof in a horizontal plane throughout substantially its entire straightaway length, said lags presenting in said run a substantially uniform surface and cooperating driven pressure means opposing said run and having a part bearing thereon in opposition to said supporting means substantially at the feeding-out end of its straightaway length for pressing the stock thereagainst to be frictionally advanced thereby.

5. In a wood planing machine the feed mechanism comprising, in combination, the bed formed by an endless series of lags, links carried by said lags, sets of pins joining the links at the joints between the lags, rollers on the pins, symmetrically disposed supporting rails for the upper run of the belt on which certain series of said rollers travel, and driving means including sprockets engaging another series of rollers.

6. In a wood planing machine the feed mechanism comprising, in combination, the bed formed by an endless series of lags, links carried by said lags, sets of pins joining the links at the joints between the lags, rollers on the pins, symmetrically disposed supporting rails for the upper run of the belt on which certain series of said rollers travel, links in said series overlapping the sides of the rails, and driving means including sprockets engaging another series of rollers.

7. In a wood planing machine the feed mechanism for advancing work to a remote point of operation of planing knives comprising, in combination, an endless series of lags providing in the upper run thereof a uniform supporting surface, rollers alternating with said lags, means for supporting each lag from the rollers at front and rear thereof, a rigid support for maintaining the upper run of said series on which said rollers travel, means for advancing the series of lags and means opposing the run for pressing the stock thereagainst to be frictionally advanced thereby.

8. In a wood planing machine the feed mechanism for advancing work to a remote point of operation of planing knives comprising one or more pairs of sprockets, a series of flat lags linked together and trained thereabout and providing in the upper run thereof a uniform supporting surface, means for supporting the upper run of the series extending from center line to center line of the sprockets, said run so supported providing an unyielding uniform travelling bed and cooperating pressure means opposing the bed to confine stock thereagainst to be frictionally advanced thereby comprising a part presented thereto approximately a pitch in the rear of the forward center line.

9. In a wood planing machine the feed mechanism comprising a sub-frame having means for attaching it to adjacent frame members of the complete machine, said sub-

frame carrying at either end bearings for sprocket shafts, shafts journalled therein carrying sprockets, longitudinal rails supported by the frame and an endless chain of lags trained about the sprockets, said lags being secured together by roller-carrying links, certain of the rollers engaging the sprockets and others running on said rails.

10. In a wood planing machine the feed mechanism comprising a sub-frame having means for attaching it to adjacent frame members of the complete machine, said sub-frame carrying at either end bearings for sprocket shafts, shafts journalled therein carrying sprockets, longitudinal rails supported by the frame and an endless chain of lags trained about the sprockets, said lags being secured together by roller-carrying links, certain of the rollers engaging the sprockets and others running on said rails, said sub-frame also carrying a roof-like dirt guard overlying the lower run of the chain.

11. In a wood planing machine the feed mechanism comprising a sub-frame having means for attaching it to adjacent frame members of the complete machine, said sub-frame carrying at either end bearings for sprocket shafts, shafts journalled therein carrying sprockets, the bearings for one of said shafts being longitudinally adjustable along the frame, longitudinal rails supported by the frame and an endless chain of lags trained about the sprockets, said lags being secured together by roller-carrying links, certain of the rollers engaging the sprockets and others running on said rails.

In testimony whereof, I have signed my name to this specification.

LAURENCE E. BLOOD.