C. W. H. BLOOD.

FEED MECHANISM.

APPLICATION FILED JAN. 16, 1917.

1,300,241.

Patented Apr. 15, 1919.

2 SHEETS—SHEET 1.

Fig. 1.

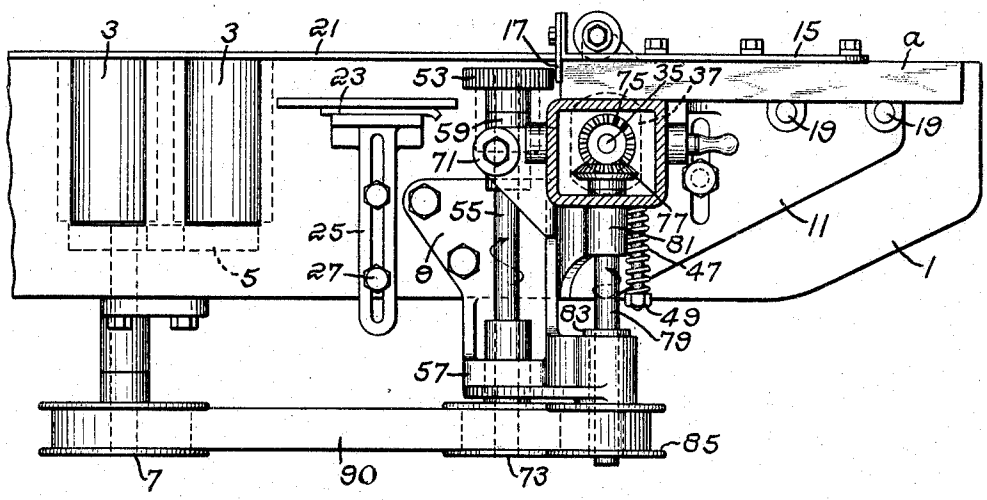
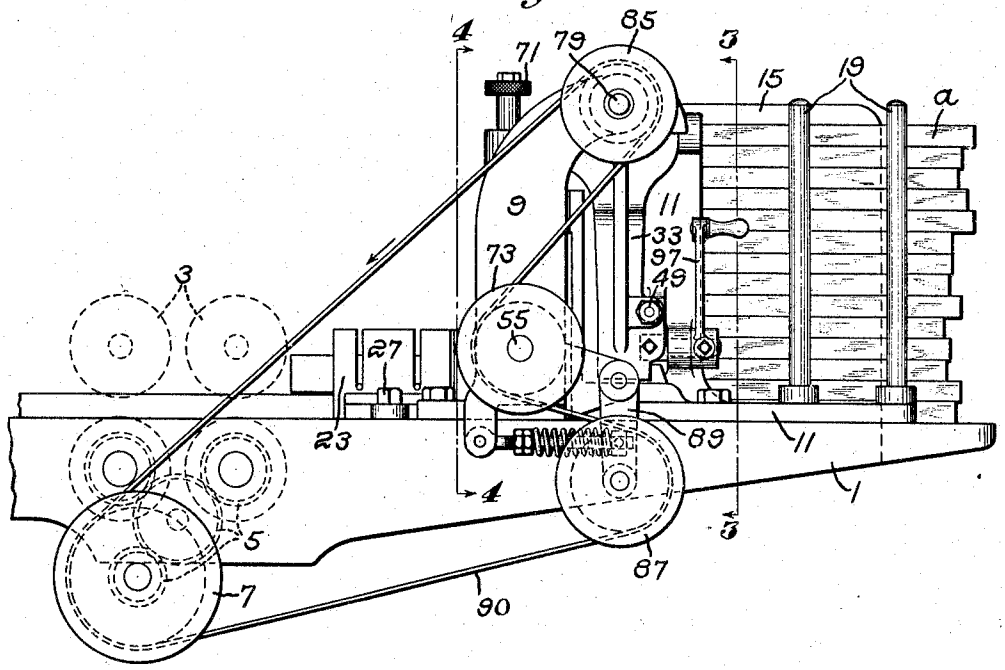


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

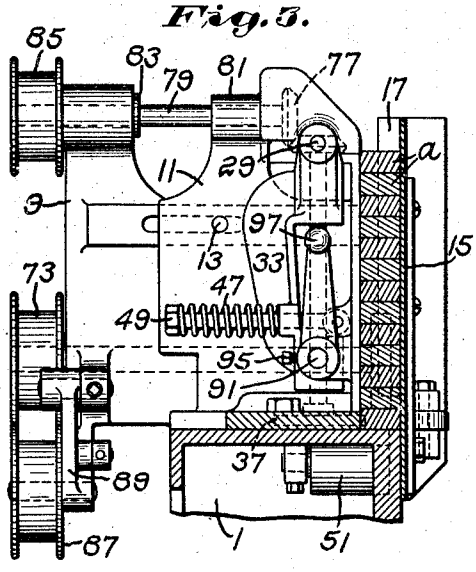


Fig. 4.

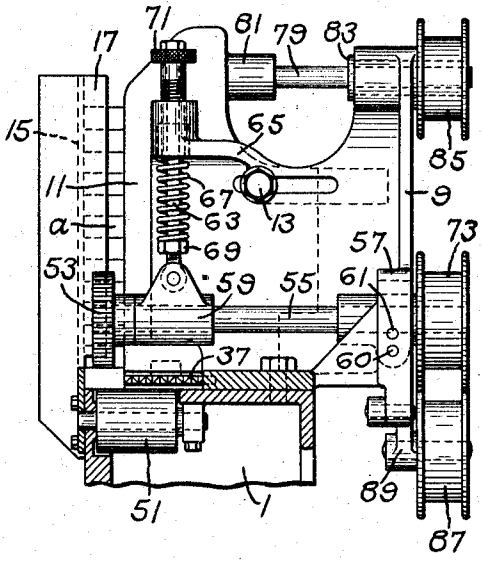


Fig. 5.

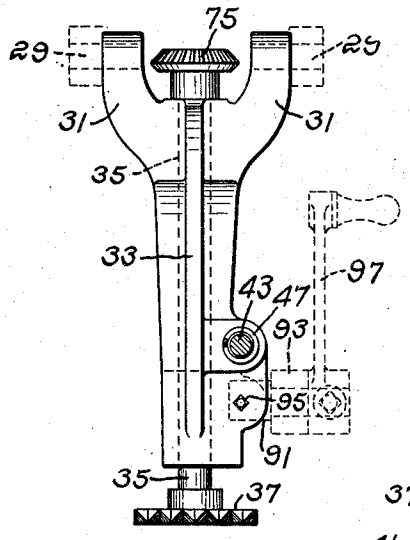


Fig. 6.

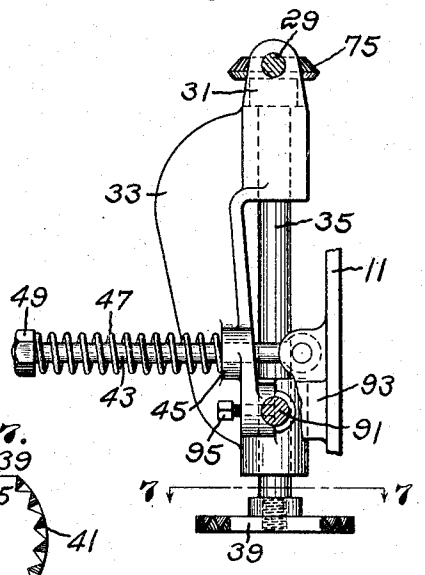
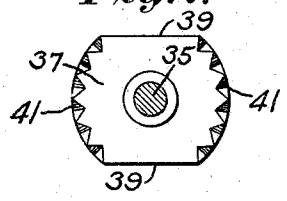


Fig. 7.



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UNITED STATES PATENT OFFICE.

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FEED MECHANISM.

1,300,241. Specification of Letters Patent. Patented Apr. 15, 1919.

Application filed January 16, 1917. Serial No. 142,750.

To all whom it may concern:

Be it known that I, CHARLES W. H. BLOOD, a citizen of the United States, and resident of Winthrop, in the county of Suffolk and Commonwealth of Massachusetts, have invented an Improvement in Feed Mechanism, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to feeding mechanisms and in particular to mechanisms of the kind which feed forward articles one by one from a supply for operation of a machine thereon. As an example of its application I may mention feeding forward strips of wood to such machines as planers and molders. It is desirable to run these machines at high speed and they are in their nature capable of much faster operation than is possible when they are fed by hand. My invention provides means whereby a continuous supply of strips to be treated can be fed to the machine without limiting its speed to suit the capabilities of an operative.

In order that my invention may be clearly understood, I will describe in detail an embodiment thereof particularly adapted for use with a molder. This embodiment is illustrated in the accompanying drawings, wherein,—

Figure 1 is a plan view of the feed end of a molding machine showing a mechanism constructed in accordance with my invention applied thereto, a part being broken away;

Fig. 2 is a side elevation of the same;

Figs. 3 and 4 are sections on the lines 3—3 and 4—4 of Fig. 2 respectively;

Figs. 5 and 6 are views on a larger scale and are a side and end elevation, respectively, of a swinging frame which carries the feeder head; and

Fig. 7 is a section on line 7—7 of Fig. 6 showing the feeder head in plan.

Referring to Figs. 1 and 2, I have there shown my invention as applied to the end of the table 1 of a molder, the mechanism being adapted to feed strips from a supply to the usual upper and lower feed rolls 3 of the machine, which are driven in any usual or suitable manner not herein illustrated. Power may be taken from the feed rolls by gearing 5 to drive a pulley 7 by which the mechanism of my feeding device is actuated.

The mechanism is carried on a pair of standards 9 and 11 mounted on the bed 1 of the machine, the standard 9 being fixedly secured thereto and the standard 11 adjustably correlated with the standard 9 by the bolt-and-slot connection 13 shown in Fig. 3. The details of construction of these standards will hereinafter appear as the mechanism is described in greater detail.

At the feed end of the machine there is provided a magazine adapted to hold a pile of strips of wood *a*. This magazine may comprise a lateral abutment wall 15 (Fig. 1) and front wall 17 which, as shown in Fig. 4, has its lower edge spaced from the bed of the machine to provide a discharge opening for the lowermost strip of the pile in the magazine. In the present instance the standard 11 with suitable posts 19 mounted thereon coöperates with the wall 15 and forms the third side of the magazine. Adjustment of the standard 11 relatively to the standard 9 by means of the bolt-and-slot connection 13 shown in Fig. 3, permits the width of the magazine to be varied to accommodate strips of different widths. The rear end of the magazine is open and thereby a pile of strips of promiscuous lengths may be placed therein as indicated in Fig. 2.

The strips are adapted to be fed forward from the magazine to the feeding rolls 3—3 in continuous succession. To guide them in their passage (see Fig. 1), there may be utilized a wall 21 forming, as it were, a continuation of the wall 15, and a coöperating adjustable guide wall 23 opposing the same and carried by the slotted plate 25 adjustable on bolts 27 which enter the machine frame.

Herein the strips in the magazine are fed down by gravity to the line of feed. To impel the bottom strip forwardly in the line of feed without interrupting the feed of the strips into that line, I utilize a mechanism which I shall next describe referring more particularly to Figs. 1, 3, 5 and 6. Pivoted on trunnions 29 (Figs. 3 and 4) to the standard 11 are the yoke-like arms 31 of a frame 33 (Figs. 5 and 6) having bearings therein for a shaft 35 on which shaft is mounted the feeder head 37 shown in plan in Fig. 7. The feeder head is conveniently made in the form of a disk having side portions cut away as shown at 39 to provide portions located at different distances from the center, that is, from the axis of the shaft 35. The outermost or distal portions 41 of the disk may be toothed as indicated. The teeth are

preferably formed by notching the edges of the disk to provide a zig-zag rib along its face as shown. While for convenience of description the head has been referred to as a disk with parts cut away, it is essentially a member having a body portion which normally hangs clear of the magazine and peripheral distal portions projecting from the sides thereof.

The frame 33 is so mounted that in its normal position the distance of the axis from the interior of the magazine is equal to or slightly greater than its distance from the cut-away face 39 of the feeder head. It will, therefore, be easily understood that, if the shaft 35 is rotated, when the cut-away portion 39 is parallel with the line of feed, as shown in Fig. 4, the magazine will be unobstructed and the strips *a* therein can feed downward under gravity. When the head has made a partial rotation, the toothed distal portions will tend to project into the magazine, as shown by the dotted lines of Fig. 1, and move through the same with a motion which exerts a force partly in the direction of the line of feed and partly toward the abutment wall 15. (See Fig. 1).

When a piece of wood is in the magazine, the head evidently cannot assume the dotted-line position shown in Fig. 1. However, the frame 33 will swing downward in Fig. 1 or in a clockwise direction viewing Fig. 3, and permit the head to deliver a percussive blow on the side of the strip in the magazine tending to force it forward out from the discharge opening beneath the front wall 17 and at the same time pressing it against guide walls 15 and 21. As the shaft 35 is rotated, the toothed portions of the head are projected in rapid recurrence into the magazine to strike a succession of blows to feed out the lowermost strip. When it has passed forward from beneath the other strips, the next strip above is permitted to fall to the bottom of the magazine into the plane of the head 37 at some moment when the cut-away face 39 of the head is presented to the side of the magazine as illustrated in Fig. 4, whereby to leave it momentarily unobstructed. The head assumes this position so frequently that the feed of strips is never interrupted but one is always being acted upon. As the head engages the sides of the strips near the leading ends the lengths thereof are immaterial. The frame 33 is preferably resiliently held to its work. For this purpose I may utilize a bolt 43 pivoted to an ear of the frame 11 and passing through a perforated ear 45 on the frame. A suitable spring 47 is interposed between the ear 45 and a nut 49 on the bolt.

The strips selected from the supply by the action of the feeder head 37 are, in the illustrated embodiment of the invention, driven forward into coöperation with a pair of fast running feed rolls which transfer them to the main feed rolls 3. These fast running feed rolls are located in front of the magazine and include the lower fixed idler roll 51, best shown in Figs. 3 and 4, which projects up through the table of the machine substantially flush with the upper surface thereof and the coöperating upper feed roll 53 best shown in Figs. 4 and 1. In Fig. 4, the roll 53 is shown mounted on a shaft 55 journaled in boxes 57 and 59. The box 57 is connected to the yoke of the standard 9 by means of a pin 60 adapted to enter any one of a series of holes 61 disposed in a vertical line. The opposite box 59 nearer the roll 53 is suspended by a pivoted bolt 63 from a bracket arm 65 and normally pressed away from the arm by a suitable spring 67 carried by the bolt between the arm and an abutment nut 69. The tension of the spring 67 may be adjusted by means of the nut to vary the pressure of the feed roll on the wood. By adjustment of the bolt 63 in the bracket arm 65 by means of sleeve nut 71, the shaft may be swung about pin 60 to vary the position of the roll 53 to accommodate strips of different thicknesses. For the greater variations the bearing box 57 may also be adjusted bodily by changing the pin 60 from one of the holes 61 to another.

The feeder head 37 and roll 53 are designed to be driven at a high rate of speed, greater than that of the main feed rolls 3 of the machine, so as to supply an uninterrupted succession of strips to the machine which operates on them. To permit these devices to press forward the series of strips, abutting end to end, to the comparatively slow running feed rolls 3, yielding driving means may be provided therefor, the illustrated form of which I shall next describe, referring particularly to Fig. 1.

The shaft 55 is driven through a pulley 73. The shaft 35 carries on its upper end a bevel gear 75 whose center is substantially on the axis of the trunnions 29, whereby its movement due to the swinging of frame 33 is minimized. The gear 75 is adapted to mesh with the gear 77 on a shaft 79 having a bearing 81 on the adjustable standard 11 and an extensible connection, as by means of a spline, with the hub 83 of a pulley 85 journaled in the standard 9. Provision is thus made for driving the shaft 35 from the pulley 85, no matter in what position of adjustment the standard 11 may be moved in order to make the magazine of proper size to receive the strips to be operated on.

As clearly shown in Figs. 2 and 3, the pulleys 73 and 85 are disposed in substantially the same plane and a pulley 87 is yieldingly mounted on the swinging, spring-pressed bracket 89 carried by standard 9

and is in the same plane as pulleys 73 and 85. The belt 90 can, therefore, be trained in the manner shown in Fig. 2 about pulleys 7, 85, 73 and 87 to rotate pulley 85 in a counter-clockwise direction and thus, through the beveled gears, drive the feeder head in a counter-clockwise direction and to rotate pulley 73 in a clockwise direction, whereby the roll 53 will feed articles delivered to it forward to the left in Figs. 1 and 2. Since the operation of the head 37 and roll 53 is much faster than is that of the feed rolls 33, the strips are fed to the latter in continuous succession, one pressing against the other. The pulley 87 provides for yielding of the driving mechanism to permit this rapid preliminary feed, as when too great resistance is encountered the bracket 89 will swing against the force of its supporting spring, loosening the belt so that it can no longer transmit power from pulley 7.

Figs. 5 and 6 best illustrate means which I have provided for temporarily disconnecting the feeder head 39 for any desired reason. I have there shown an assymmetrically headed pin 91 journaled in an ear 93 of standard 11, which pin is adapted to cooperate with an abutment on the frame 33 herein exemplified by an adjustable screw 95. When that portion of the head of pin 91 which is of lesser radius is in contact with the screw as indicated in Fig. 6, the frame will hang in its normal vertical position and may yield to the left in the operation of the machine as may be necessary. If, however, the pin 91 is turned, for example, by means of a suitable hand crank 97, the portion of greater radius will engage the screw and swing the frame to the left into such position that the toothed portions 41 of the disk-like head will no longer enter the magazine when the shaft 35 is revolved.

From the description of the illustrative embodiment of my invention here disclosed it will be apparent that I supply a feeding mechanism which is adapted to feed forward without interruption articles from a supply. The feeder head 37 operates continuously and no sooner has one article passed out from coöperation therewith than a second is delivered thereto and is fed forward after the first without intermission. It will be noted, furthermore, that the lengths of the strips acted upon are not a factor in the operation of the head. Consequently the number of strips of different lengths may be piled in the magazine and fed forward without any break in the progression. The feeding head 37 bears yieldingly against the side of the lowermost strip and accommodates itself to slight variations in the widths thereof, while for major variations the whole mechanism may be readily adjusted. Not only does the apparatus feed the strips forward, but it positions them by pressing them against the guide walls 15 and 21.

In the present specification I have described in considerable detail the embodiment of my invention chosen for purposes of illustration. It will be understood, however, that I have done so in order that the mechanical construction might be more readily apprehended and not because the details are of the essence of the invention.

What I do claim and desire to secure by Letters Patent is:

1. The feed mechanism comprising, in combination, a magazine to receive a supply of articles and having a discharge opening, and means for feeding forward articles from the supply in uninterrupted succession through said opening including a driven member having a portion arranged for yielding, rapidly recurrent projection laterally into said magazine adjacent said opening under an intrinsic rule and independently of the feeding of the articles and having feeding movement therein.

2. The feed mechanism comprising, in combination, a magazine to receive a pile of articles and including a lateral abutment and a front wall providing a discharge opening, and a feeding member operating substantially in the plane of said opening and having an intrinsic law of operation effecting recurrent projection of the same into the magazine independently of the feeding of the articles for yielding impinging on the articles therein to exert a resultant oblique force toward the opening.

3. The preliminary feed mechanism comprising a magazine including a lateral abutment and an end wall having provision for passing a single article, a swinging frame mounted opposite said abutment and having bearings therein, a shaft in said bearings carrying a feeder head which has a main body arranged to lie clear of the interior of the magazine and one or more peripheral projections normally extending into said magazine and means to rotate the shaft, the projection or projections being so located on the body as to leave the magazine unobstructed by the head in a phase of the revolution.

4. The preliminary feed mechanism comprising, in combination, a magazine to receive a pile of articles and a disk having a cut-away side yieldably mounted adjacent the side of the magazine said disk lying clear of the interior of the magazine when said cut away portion is presented toward the same, whereby to permit supply of articles to the plane of the disk and normally projecting its distal edge portions into the magazine when presented toward the same and means to drive the disk.

5. The preliminary feed mechanism comprising, in combination, a magazine to re-

ceive a pile of articles, a high speed continuously acting feeding device, and means to feed individual articles from the magazine thereto including mechanism operating at the side of the magazine and driving means therefor effecting an intrinsic motion thereof, causing the same intermittently to enter the magazine to bear frictionally on the articles therein and having feeding motion therethrough.

6. Mechanism for feeding articles endwise in succession in a given direction, comprising means to supply articles laterally to the line of feed, and means to feed them forward one by one comprising a device located transversely to the plane defined by the line of feed and the line of supply, and driving means therefor effecting rapid, regular, recurrent projection thereof into the path of articles delivered to the line of feed and having a component of motion along that line.

7. The preliminary feed mechanism comprising, in combination, a magazine to receive a pile of articles and a member mounted adjacent the side of the magazine and having a main body portion located beyond the boundary of the magazine and a distal portion extending therefrom at a side thereof and means to operate said member recurrently to project said portion into the magazine, the interior of the magazine being unobstructed by said member at recurrent intervals alternating with the entrances therein of said distal portions.

8. The preliminary feed mechanism comprising, in combination, a magazine to receive a pile of articles and a member mounted adjacent the side of the magazine and having a main body portion located beyond the boundary of the magazine and a peripheral projection extending therefrom and means to operate said member recurrently to move said projection forwardly through the magazine, said projection being arranged to yield under contact with articles in the magazine, the magazine being unobstructed by said member at recurrent intervals alternating with the entrances therein of said distal portions.

9. The preliminary feed mechanism comprising, in combination, a magazine to receive a pile of articles and a driven, yielding, pressure device mounted exteriorly of the boundaries of the same having an intrinsic law of motion independently of the articles operated upon effecting recurrent projection thereof within the said boundaries, said device arranged to exert on articles encountered within said boundaries a diagonal pressure having a component in the line of feed.

10. The preliminary feed mechanism comprising, in combination, a magazine to receive a pile of articles, a shaft yieldably mounted beside the same, a circular head on said shaft cut away along a chord, the distance between the normal location of said shaft and the boundary of the magazine being less than the radius of said head and not less than the distance of said chord from the center.

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

CHARLES W. H. BLOOD.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."