

May 24, 1932.

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1,860,144

STRIP FEEDING MACHINE

Original Filed Feb. 4, 1927

3 Sheets-Sheet 1

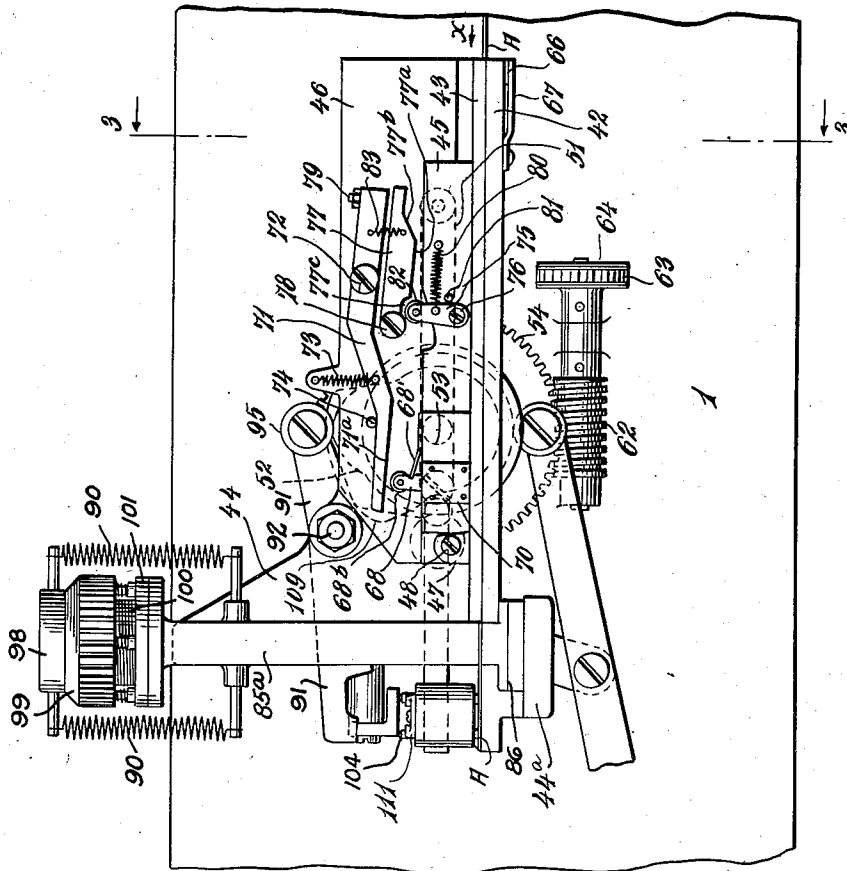


Fig. 1.

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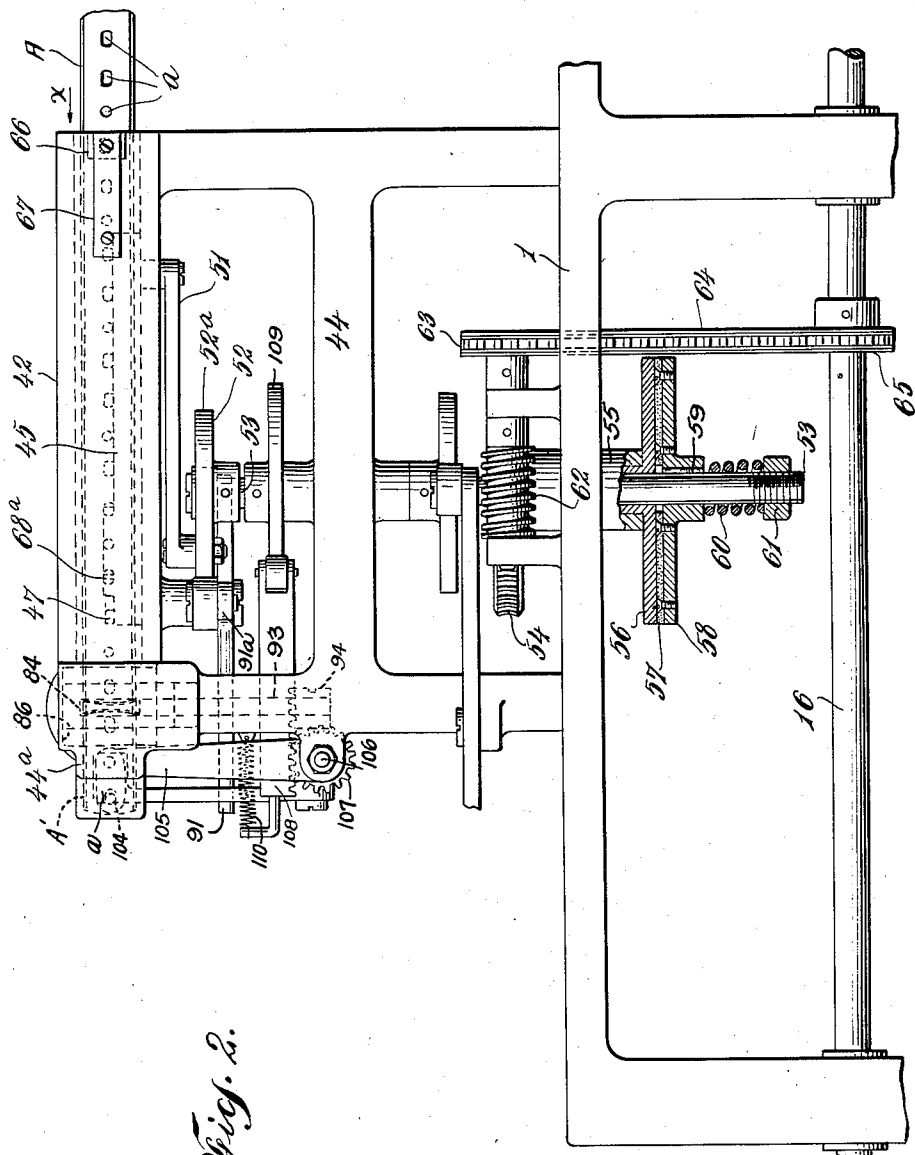
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STRIP FEEDING MACHINE

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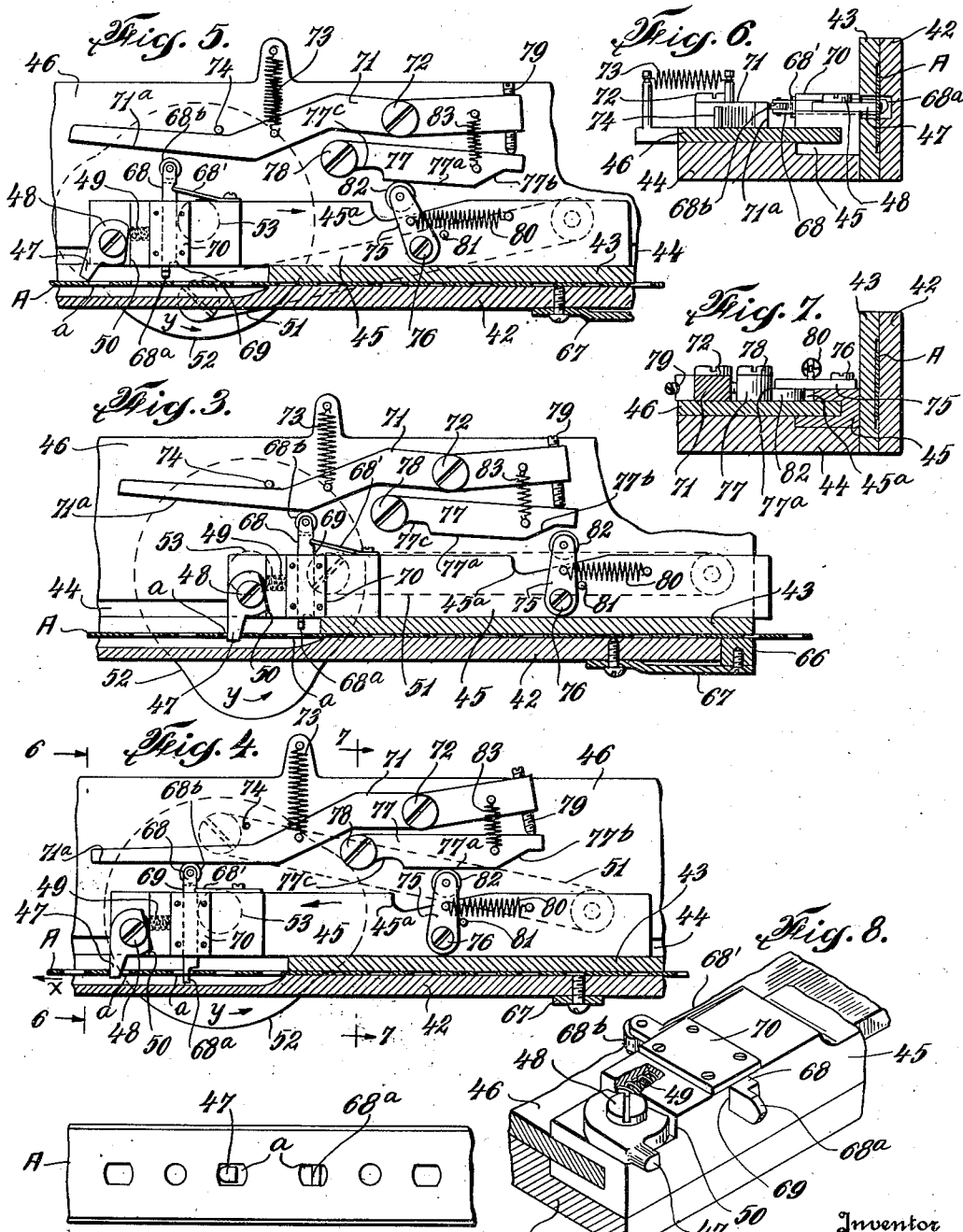


Fig. 9.

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UNITED STATES PATENT OFFICE

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STRIP FEEDING MACHINE

Original application filed February 4, 1927, Serial No. 165,903. Divided and this application filed January 2, 1931. Serial No. 506,149.

This application is a division of our application Serial #165,903, filed February 4, 1927, for sharpening machine.

An object of this invention is to feed a perforated strip, such as a sharpened strip adapted for the production of blades, step by step, whereby the strip may be severed for the production of blades of definite lengths therefrom.

The invention comprises novel details of improvement that will be more fully hereinafter set forth and then pointed out in the claims.

Reference is to be had to the accompanying drawings wherein:—

Fig. 1 is a plan view of a machine embodying our invention;

Fig. 2 is a front elevation of Fig. 1;

Figs. 3, 4 and 5 are detail sectional plan views of strip feeding means embodying our invention;

Figs. 6 and 7 are sections respectively on lines 6, 6 and 7, 7 in Fig. 4;

Fig. 8 is a perspective detail of a portion of the strip feeder and

Fig. 9 is a detail of a portion of the strip with respect to its feeding devices.

Similar numerals of reference indicate corresponding parts in the several views.

The numeral 1 indicates a main frame which may be of any suitable construction. At A is a perforated strip such as a strip of thin steel sharpened along its edges and having spaced perforations at *a*. The strip A may be sharpened and perforated and supplied from a reel, in any desired way. The devices to be described will feed the strip A definite distances, step by step, whereby the strip may be cut into desired lengths, such as one length for each feeding step of the strip. The strip passes between spaced guiding plates 42, 43, supported on a framing 44 on the main frame, and a reciprocative member 45 is operative along guide 43 and along a guide plate 46, (Fig. 7), supported on said framing. Member 45 is provided with a finger 47 pivoted on the member at 48 adapted to cooperate with strip A and to enter perforations therein, a spring 49 bearing against said finger and against member 45 normally

tending to press the finger toward strip A, (Fig. 3). The movement of finger 47 by the spring is limited by the stop 50 on member 45, (Fig. 8). The tip end portion of finger 47 is shaped to enter apertures *a* of strip A, (Figs. 4 and 5). Member 45 is reciprocated by means of a link 51 pivotally attached thereto and pivotally connected to a crank member 52, (shown in the form of a cam for a purpose to be described), the part 52 being shown carried by a shaft 53 journaled in suitable bearings in framing 44. Shaft 53 is rotated by the medium of frictional devices and gearing shown comprising a worm wheel 54 secured to a sleeve 55 receiving shaft 53 and provided with a friction disk 56 in engagement with a friction member 57 secured to a disk 58 surrounding shaft 53 and slidably connected therewith by a key at 59, a spring 60 on said shaft bearing against disk 58 and against a stop nut 61 on shaft 53. Worm wheel 54 is rotated by a worm 62 journaled in bearings on frame 1 and provided with a sprocket wheel 63 receiving chain 64 from a sprocket 65 on drive shaft 16.

Member 45 and finger 47 move to the left in Fig. 3 for feeding strip A, and to resist reverse motion of finger 47 along the strip a friction member or pad 66 is shown adapted to bear resiliently against a side of the strip, being mounted upon a spring 67 secured to guide plate 42. To maintain the strip A in proper position for cutting blades successively therefrom, (in addition to such sustaining of the strip as is accomplished by the finger 47), a supporting and aligning member 68 is slidably guided in a bearing 69 in member 45 and retained by plate 70 secured on said member, the operative end 68a of member 68 being shown tapering to enter the apertures *a* in strip A, (Figs. 1, 3, 4, 5 and 8). An arm or lever 71 is pivotally supported at 72 upon the guide plate 46 to move member 68 toward strip A. A spring 73 connecting arm 71 with plate 46 normally retains said arm against a stop pin 74 on said plate. The feeding movement of member 45, (toward the left in Figs. 3 and 4), causes operation of arm 71 to push member 68 into an aperture in strip A by means of an arm 75 pivotally supported at 76

on member 45, (Fig. 7), and operative against an arm 77 pivotally supported at 78 on plate 46 by engagement with an interposed threaded stop or screw 79 shown adjustably carried on arm 71. A spring 80 normally retains arm 75 in engagement with a stop pin 81 on member 45. The arm 75 is shown provided with an end friction roller 82 to engage the under surface 77a of arm 77, the member 45 being shown provided with a recess 45a to receive said roller 82. The arm 77 has an inclined edge 77b adapted to be engaged by roll 82 to tilt the arm and said arm is provided with a recess 77c to receive roll 82 approximately at the stopping point of member 45 on the feeding stroke. Arm 77 is normally maintained against stop 79 by means of a spring 83 connecting the arms 71 and 77.

With the parts in the inactive or retracted position shown in Fig. 3 the member 52 will rotate in the direction of the arrow *y* in said figure to cause member 45 to move to the left, whereupon roller 68b on member 68 will advance under the straight edge 71a of arm 71 and roller 82 will engage the inclined edge 77b of arm 77, thereby causing arm 71 to be tilted to push the end 68a of member 68 into an aperture *a* in strip A, with said rollers rolling along the corresponding edges 71a and 77a, the finger 47 propelling the strip while the member 68 retains the strip in required edgewise alignment. Fig. 4 illustrates the parts substantially in halfway feeding position to the left. When the full feeding stroke of member 45, carrying the strip A along, terminates the roller 82 will have entered the recess 77c in arm 77 and spring 73 will cause tilting of arms 71 and 77, as indicated in Fig. 5, spring 68' causing member 68 to move outwardly to release strip A. On the return stroke of member 45 the roller 82 will engage the right hand inclined portion of recess 77c causing arm 75 to tilt into recess 45a of member 45 so that roller 82 may ride along the edge 77a of arm 77, and the finger 47 will recede from the aperture *a* in strip A. Fig. 5 illustrates a substantially halfway return of member 45 and when said member reaches the stopping position of Fig. 3 the arm 75 will be released from arm 77 and spring 80 will restore arm 75 to the normal position against pin 81 with the parts ready for another feeding operation. It will be understood from the foregoing that each time that member 45 retreats from a feeding stroke the finger 47 will emerge from an aperture *a* in strip A and slide along the latter, and when member 45 advances on a feeding stroke said finger will enter the strip to feed it and member 68 will be projected through the strip to align and support it until the termination of the feeding stroke of member 45, the distance fed at each, forward stroke of member 45 being

equal to the length of steel to be cut from the strip.

A blade cutting-off tool is indicated at 84 reciprocative in a guideway in a tubular member 85 supported by the framing 44 and shown located adjacent to the reciprocative feeding member 45, (Fig. 1), in such position that the operative end of tool 84 may engage strip A. Opposing the operative end of tool 84 is a strip resisting member or die, indicated generally at 86, supported by screws in an arm 44a on framing 44. To operate the tool 84 the same is connected by springs 90 with the guideway member 85, normally tending to force the tool towards strip A. The tool is drawn away from the strip against the tension of springs 90 by means of an arm or lever 91 pivoted at 92 and operative against a finger 93 pivoted on framing 44, a free end of the finger being operative with tool 84. The peripheral surface 52a of member 52 is shown in the form of a cam cooperative with arm or lever 91, which is shown provided with an anti-friction roll 95 to engage the cam, for moving the arm in one direction, said arm having a projection 91a extending at an angle to the plane of the arm to be engaged by said cam, whereby the arm 91 will be rocked back and forth during a complete rotation of member 52. When cam member 52 rotates it will rock the arm 91 to cause it to push back the finger 93 which, by means of suitable devices, such as shown in our companion application Serial No. 506,150, filed Jan. 2, 1931, will cause retraction of the tool from the strip A. During continued rotation of the cam member it will operate arm 91 and when said member has rotated sufficiently the arm 91 will permit the tool 84 to be released and spring 90 will cause the tool to strike a sharp blow serving to separate blade A' from the strip. The cutting or severing operation of tool 84 occurs each time that the feeding member 45 is brought to rest at the end of the feeding stroke. The tool 84 is shown provided with a head 98 adapted to engage a stop 99 shown adjustably secured by screw threads 100 to a fitting 101 secured at the outer end of guideway member 85, interposed springs at 102 resisting the thrust of the tool against stop 99 at the threads 100, (Fig. 1). Stop 99 may be adjusted respecting head 98 to control the operation of the tool 84 against strip A.

The blades A' may be successively received on pins 104 to enter perforations *a* in the blades, which pins are slidable in bores in an arm 105 pivotally supported at 106 on framing 44 of frame 1, (Fig. 2). Said arm is provided with a gear 107 in mesh with a slidable rack 108 guided on framing 44 and operative by a cam 109 on shaft 53, a spring 110 connecting rack 108 with framing 44 operating the rack in opposition to said cam. At each rotation of cam 109 the arm 105 will be rocked

to the left from the position shown in Fig. 2 to a place of deposit of blades, and will be returned to the position of Fig. 2, for delivering blades cut off from strip A by tool 84 as the strip A is fed step by step. The devices described for operating the pins 104 are similar to the corresponding parts set forth in our Letters Patent No. 1,788,570, issued Jan. 13, 1931, on our first named application.

Having now described our invention, what we claim is:—

1. Means for feeding a perforated strip comprising a reciprocative member having a movable finger to enter the strip to feed it and to recede from the strip, means to reciprocate the member, an aligning member for the strip carried by the reciprocative member, means to cause the aligning member to enter the strip and means to permit said member to recede from the strip.

2. Means for feeding a perforated strip as set forth in claim 1, in which the means for operating the aligning member includes means to cause recession of said member from the strip before the reciprocative member returns from a strip feeding stroke.

3. Means for feeding a perforated strip comprising a reciprocative member having a movable finger to enter the strip to feed it and to recede from the strip, means to reciprocate said member, an aligning member for the strip movably carried by the reciprocative member and spaced from the finger such a distance as to enter an aperture in the strip when the finger is in a different aperture in the strip for aligning the strip during its feeding, and means to permit recession of the aligning member from the strip before the reciprocative member starts to return from a strip feeding stroke.

4. Means for feeding a perforated strip as set forth in claim 3, in which the means for permitting recession of the aligning member comprises an arm cooperative with the member, and means cooperative between the arm and the reciprocative member for causing the arm to push the aligning member toward the strip on the feeding stroke of the reciprocative member and for causing the arm to release the aligning member at the termination of said feeding stroke.

5. Means for feeding a perforated strip as set forth in claim 3, in which the means for permitting recession of the aligning member comprises an arm cooperative with the member, a second arm pivotally supported and cooperative with the first named arm, and means upon the reciprocative member cooperative with the second named arm to actuate the latter to move the first named arm for pushing the aligning member in an aperture in the strip on the feeding stroke of the reciprocative member, the second named arm having a recess cooperative with said means

on the reciprocative member to cause the first named arm to release the aligning member at the termination of the feeding stroke of the reciprocative member.

6. Means for feeding a perforated strip as set forth in claim 3, in which the means for permitting recession of the aligning member comprises an arm cooperative with the member, a second arm pivotally supported and cooperative with the first named arm, and a spring-actuated arm pivotally supported on the reciprocative member, the latter having a recess for said arm, the second named arm having a recess for the last named arm cooperative therewith at the termination of the feeding stroke of the reciprocative member for causing the first named arm to release the aligning member from the strip.

7. Means for feeding a perforated strip comprising a reciprocative member having a movable finger to enter the strip to feed it and to recede from the strip, means to reciprocate said member, an aligning member for the strip movably carried by the reciprocative member and spaced from the finger such a distance as to enter an aperture in the strip when the finger is in a different aperture in the strip for aligning the strip during its feed, an arm pivotally supported and cooperative with the aligning member to push it toward the strip, a spring to actuate said arm for releasing the aligning member from the strip, a second arm pivotally supported with relation to the first named arm, a spring connecting said arms, and an adjustable stop carried by one of the arms and cooperative with the other arm, the second named arm having an inclined portion and having a recess spaced therefrom, the reciprocative member being provided with a pivoted spring-acting arm adapted to engage the inclined portion of the second named arm on the feeding stroke of the reciprocative member to actuate the two first named arms to cause the aligning member to enter an aperture in the strip, the recess in the second named arm opposing the third named arm at the termination of the feeding stroke to cause the first named arm to operate to permit the aligning member to recede from the strip before the return stroke of the reciprocative member.

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