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BOOK MATCH MACHINE

Original Filed April 30, 1925

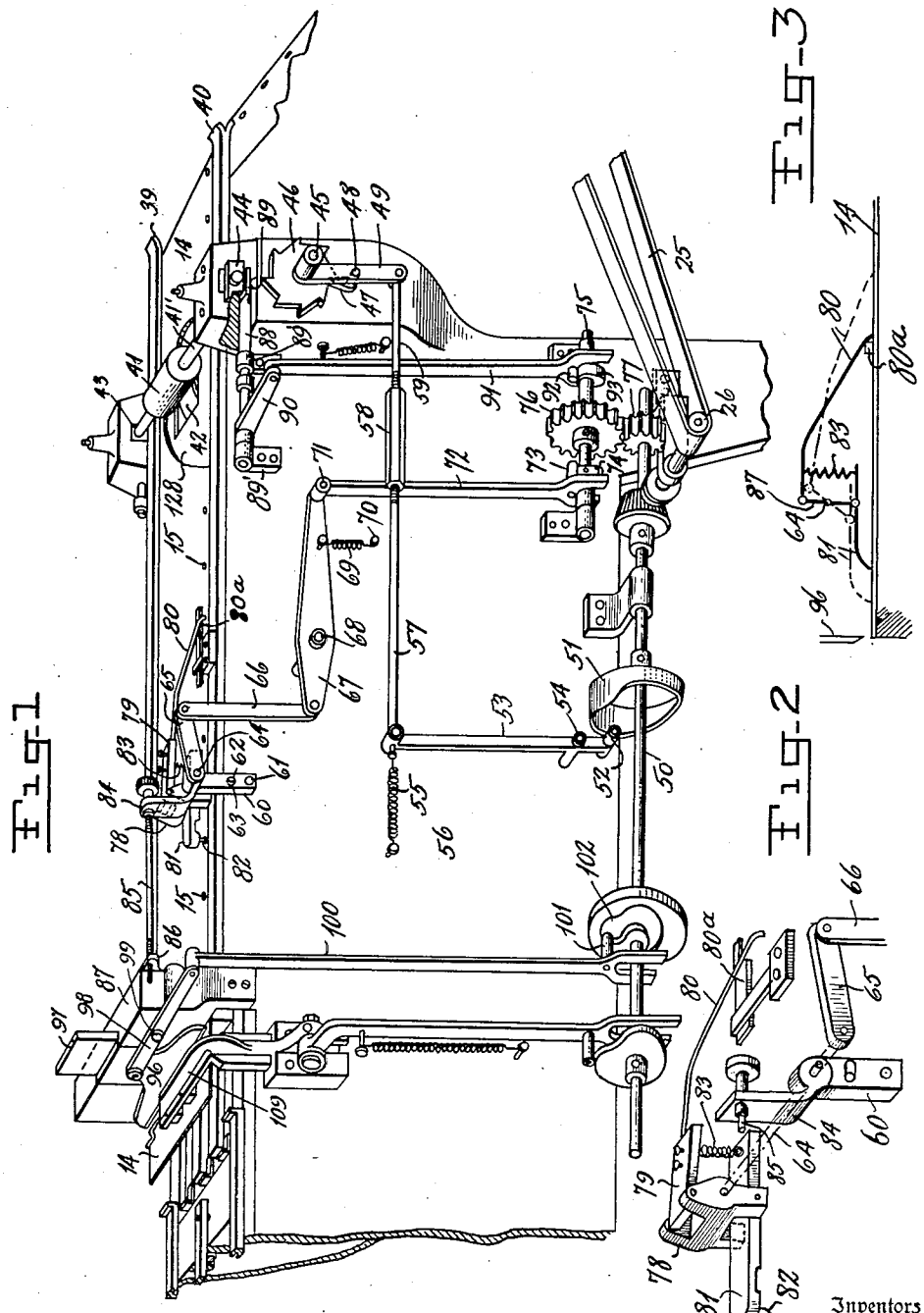


Fig-1

Fig-3

Fig-2

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LEO GREENBAUM, OF FAR ROCKAWAY, EDWARD VAN HOOFSTADT, OF BROOKLYN, AND CHARLES GUSTAVSON, OF WOODSIDE, NEW YORK, ASSIGNORS TO LION MATCH CO., INC., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

BOOK-MATCH MACHINE.

Original application filed April 30, 1925, Serial No. 27,110. Divided and this application filed January 6, 1928. Serial No. 244,806.

This invention relates to machines for making book matches and this application, which is a division of Ser. No. 27,110, filed April 30, 1925, is directed to mechanism for accurately positioning match book cover stock to be operated upon by a cutter to form cover blanks.

Mechanism of this character has been found highly desirable for numerous reasons among which may be mentioned the production of books of uniform width, and the uniform positioning of the printing on the match book covers.

Features of the invention, other than those specified, will be apparent from the hereinafter detailed description and claims, when read in conjunction with the accompanying drawings.

The accompanying drawings illustrate one practical embodiment of the invention, but the construction therein shown is to be understood as illustrative, only, and not as defining the limits of the invention.

Figure 1 is a perspective view showing such parts of a book match making machine as are necessary to illustrate the present invention.

Figure 2 is a perspective view showing portions of the machine of Figure 1 removed from such machine and illustrated in diagrammatic relation to more clearly show the structure of these parts; and,

Figure 3 is a diagrammatic view illustrating different positions of which the mechanism for accurately positioning the book match stock partake during the operation of the machine.

Referring to the drawings, it will be observed that the paper strip 14 passes into the machine between the flared ends of the guides 39 and 40, and between the rollers 41 and 42 over the pan 128, the roller 41 being mounted in the bearings 43 and 44, and the roller 42, upon the shaft 45 carrying the ratchet wheel 46 in the path of the pawl 47 secured upon the pin 48 of the lever 49 which is adapted to oscillate upon the shaft 45. 50 is the drive shaft of the machine and carries the cam 51, one side of which engages the roller 52 at the lower end of the rod 53 pivotally mounted at 54 and secured at the upper end by the spring 55 anchored to the frame 56 of the machine. At the upper end of the lever 53 is pivotally secured the rod 57 connected by turn-buckle 58 to the rod 59 pivotally connected to the lower end of the lever 49, so that as the latter is oscillated upon the shaft 45 by action of the cam 51, the pawl 47 engaging the ratchet wheel 46 periodically rotates the same one tooth at a time, thereby causing the feed roller 42 upon which the paper strip 14 rests to feed the same, the roller 41 pressing thereon by spring tension as usual in such feeds.

Referring to the feed of the roller 41 upon the shaft 41′, it will be observed that a shaft or rod 88 is provided with an offset 89 immediately beneath the shaft 41′ so that as the shaft or rod 88 oscillates, the roller 41 is intermittently lifted from the sheet or strip 14, thereby intermittently discontinuing the feed thereof, the shaft or rod 88 being provided with brackets 89′ and also having an arm 90 pivotally connected to the link 91, the lower end of which is provided with a roller 92 adapted to ride upon the cam 93 upon the shaft 75.

The purpose of the rollers 41 and 42 is to feed the strip 14 longitudinally of the machine to a knife or cutter 96. This feed is intermittent and the knife operates while the strip 14 is at rest. Thus, the rollers 41 and 42 feed a predetermined length of the strip 14, are then disengaged therefrom and while they are disengaged and the strip is at rest, the cutter 96 operates to cut off a portion of the end of the strip. The cutter is mounted for movement with the slide 97 guided in a suitable block 87 and is actuated by a lever 98 pivoted at 99 and having a link connection 100 on which is mounted a follower 101 cooperating with the cam 102 fixed on the main shaft 50. The details of the cutter and its associated mechanism are fully described in the copending application of which this case is a division and further details thereof need not be given here. In practice, any suitable cutter may be employed. It is the primary purpose of this invention, however, to render accurate the feed of the strip 14 so that at successive operations of the cutter 96, uniform lengths of the strip may be severed therefrom and the cuts properly spaced with reference to printing on the reverse side of the cover

blanks. The mechanism whereby this may be accomplished will now be described.

60 indicates a suitable bracket secured upon the side frame 56 of the machine by a screw or bolt such as 61 and having an elongated slot 62 thru which the screw or bolt 63 passes, thus allowing for the adjustment of the bracket 60 upon its pivotal support 61. The bracket 60 provides bearing for the shaft 64, said shaft being rigid with an arm 65 which in turn is pivotally connected to the link 66 pivotally connected at the opposite end to the lever 67 pivotally mounted at 68 in the side of the machine 56 and retained by the spring 69 anchored at 70, the opposite end of the lever 67 being pivotally connected at 71 to the link 72, the lower end of which is provided with a pin 73 which rides upon the cam 74 under the countershaft 75 having gear 76 driven by pinion 77 upon the drive shaft 50. From this it will be seen that with each rotation of the drive shaft 50, the shaft 64 is oscillated, and upon the other end of the shaft 64 is mounted a housing 78 which has pivotally mounted in the upper part thereof the bracket 79 carrying the resilient finger 80, and in the lower part of said housing is pivotally mounted the bracket 81 having finger or entering point 82. The bracket 81, it will be observed, extends beneath the bracket 79, and 83 is a tension spring between said brackets tending to keep the fingers 80 and 82 depressed. Accordingly, as the shaft 64 oscillates in a clockwise direction as viewed in Figure 1, the fingers 80 and 82 feel for and enter, in succession, cooperating perforations 15 in the paper strip 14. As this operation occurs while the roll 41 and the knife 96 and foot 109 are elevated, the paper strip is free to shift longitudinally. It therefore follows that when the shaft 64 has been oscillated to its full extent in the direction stated, the fingers 80 and 81 will have served to shift the strip longitudinally into proper adjusted relation with respect to the knife 96, so that when the knife subsequently descends, the cut is correctly positioned with respect to the length of the strip, the fingers holding the strip until the cut is completed. The bracket 60 it will be observed continues upwardly providing a bearing 84 which is threaded to receive the screw 85, the end of which engages threads in the offset 86 of the block 87 so that by turning the screw 85 the angle of the bracket 60 upon the pivotal support 61 may be varied and the feed of the fingers 80 and 82 may be slightly retarded or advanced as may be found necessary.

The operation of the parts 80 and 81, which may be termed feeler fingers because of their peculiar function is diagrammatically shown in Figure 3. When the shaft 64 is oscillated into its normal position, the housing 78 extends substantially vertically as shown in Figure 3. At this time, the free ends of the fingers 80 and 81 will be drawn toward one another so that they are now at the minimum distance apart as illustrated in full lines in Figure 3. As the finger 80 moves into this position, it engages with a projection 80^a, which lifts the finger slightly so that when in the full line position of Figure 3, the free end of the finger 80 will be free from the paper strip 14. When, however, the shaft is oscillated in a clockwise direction, the parts move from the full line position of Figure 3 into the dotted line position of this figure. During this operation, the fingers 80 and 81 both engage with the face of the paper strip as they are moved apart and if, during its movement, the strip is not in exactly the correct longitudinal adjustment with reference to the knife 96, one or the other of the fingers will engage with one of the perforations 15 and cause the paper to be shifted longitudinally in one direction or the other in order to obtain the desired adjustment.

As long as the fingers 80 and 81 are in the position shown in full lines of Figure 3, the projection 80^a will slightly elevate the finger 80 so that the strip 14 can travel without the finger engaging the perforations therein. During this same period, the free end of finger 81 will be free to slide over the strip because the beveled lower end of the finger will cause it to be elevated out of the perforations when the strip moves. In other words, the fingers 81 can only act positively to shift the strip when said finger is moved to the left and the finger 80 can only act positively when moved to the right. When retracted, both fingers slide idly over the strip.

When the parts move from the full to the dotted line positions of Figure 3, if the strip has slightly lagged during the previous feed of the rollers 41 and 42, the finger 81 will engage a perforation and shift the strip forward into correct position. But, if the strip has been overfed by said rollers, then the finger 80 will engage with a perforation to move back the strip into proper position. At the completion of the working operation of the fingers, both are in corresponding perforations of the strip and as the fingers are retracted they are withdrawn from both perforations and returned to the full line position of Fig. 3, whereupon the next feeding operation of the rollers 41 and 42 takes place.

It will of course be understood in this connection that the perforations 15 in the paper are accurately spaced apart, so that through the manipulation of the strip as described, the cutting of the strip by successive operations of the knife 96 will be uniform. In other words, uniform lengths of the strip will be cut at successive operations.

The foregoing detailed description sets forth the invention in its preferred practical form, but the invention is to be understood as fully commensurate with the appended claims.

Having thus fully described the invention, what we claim as new and desire to secure by Letters Patent is:

1. In a match book forming machine, means for guiding a perforated strip of material along a predetermined path, means for intermittently feeding predetermined lengths of the material along said path and for releasing said material for longitudinal adjustment between feeding operations, a rocking member extending transversely across the strip and spaced therefrom, feeler fingers pivoted to the rocking member on opposite sides of the axis of oscillation of said member and extending in opposite directions along the strip, and means for oscillating said member to alternately engage and disengage the feeler fingers with the perforations in the strip during non-feeding periods of the strip for the purpose of longitudinally adjusting the strip.

2. In a match book forming machine, means for guiding a perforated strip of material along a predetermined path, means for intermittently feeding predetermined lengths of the material along said path and for releasing said material for longitudinal adjustment between feeding operations, a rock shaft extending transversely of the strip and spaced above the same, feeler fingers pivotally mounted on the rock shaft on pivots arranged above and below the axis of the shaft, with the feeler finger pivoted above the shaft extending along the strip in one direction and the feeler finger pivoted below the shaft extending along the strip in the opposite direction, and means for oscillating the shaft to engage the feeler fingers with the perforations in the strip between feeding periods of the strip for the purpose of longitudinally adjusting the strip.

3. In a match book forming machine, means for periodically feeding, through the machine, a strip of material having longitudinally spaced holes therein, a plurality of strip adjusting prongs adjacent said strip, at least one of which extends forwardly and at least another of which extends rearwardly of the direction of feed of the strip, all of said prongs being ineffective to positively engage the holes of the strip while the strip is being fed, and means, operable during non-feeding periods of the strip, for forcing all of the prongs for a predetermined distance along the strip in engagement therewith and in the respective directions in which they extend, whereby they are adapted to engage with the holes in the strip to rectify non-feed or over-feed thereof.

4. In a match book forming machine, a pair of rotating rollers between which a strip of material having longitudinally spaced holes is fed through the machine, means for periodically separating said rolls to cause cessation of the feed of the strip, a plurality of strip adjusting prongs adjacent said strip, at least one of which extends forwardly and at least another of which extends rearwardly of the direction of feed of the strip, all of said prongs being ineffective to positively engage the holes of the strip while the strip is being fed, and means, operable during non-feeding periods of the strip for forcing all of the prongs for a predetermined distance along the strip in engagement therewith and in the respective directions in which they extend, whereby they are adapted to engage with the holes in the strip to rectify non-feed or over-feed thereof, said prongs engaging said holes to adjust the strip only when the rolls are separated.

5. In a match book forming machine, means for periodically feeding, through the machine, a strip of material having longitudinally spaced holes therein, a pair of adjusting fingers mounted for longitudinal movement, one in the direction of movement of the strip and the other in a counter-direction, while both are engaged with the strip, both of said fingers being ineffective to positively engage the holes in the strip while the strip is being fed, and means, operable during non-feeding operations of the strip, for simultaneously forcing said fingers in opposite directions for predetermined distances along the strip whereby one or the other thereof is adapted to first engage with one of the holes in the strip to shift the strip longitudinally until the other finger enters another hole, for the purpose of rectifying non-feed or over-feed of the strip and adjusting the strip in predetermined position.

In testimony whereof we have signed the foregoing specification.

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