

April 12, 1966

A. I. ROSHKIND

3,245,861

WEB SPLICER

Filed March 24, 1961

7 Sheets-Sheet 1

FIG. 1

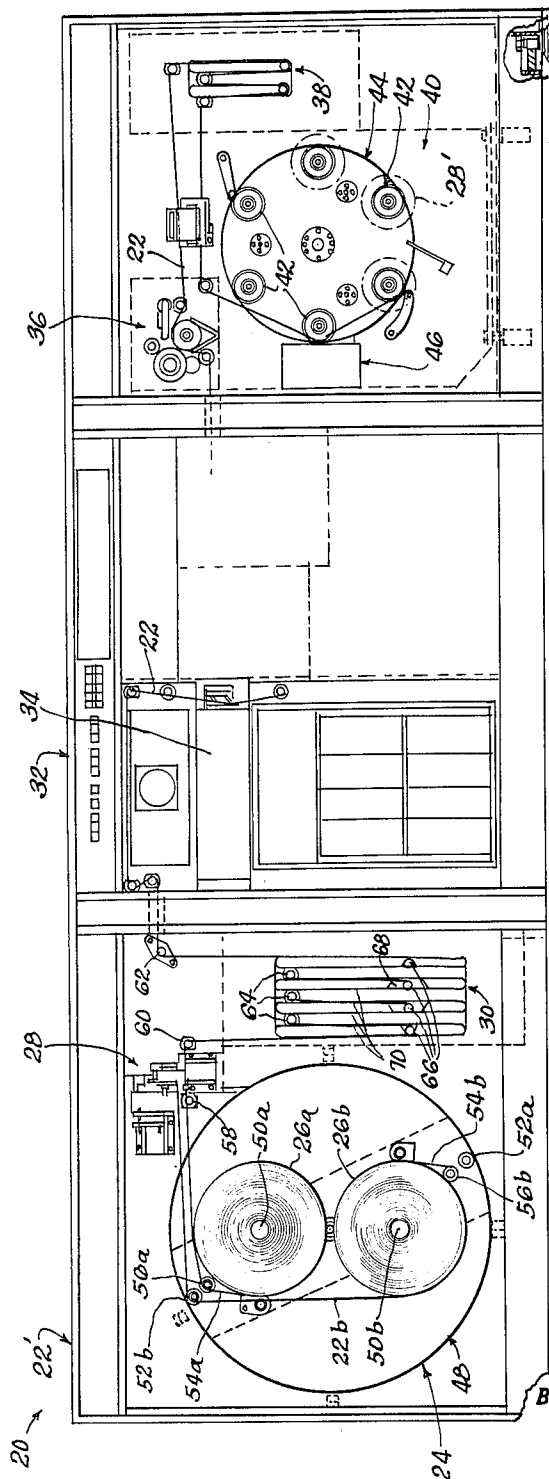


FIG. 2

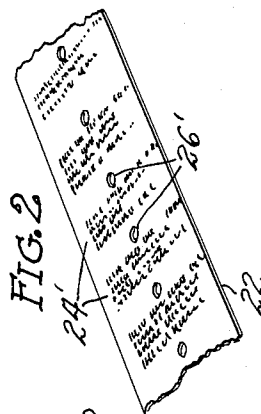


FIG. 4

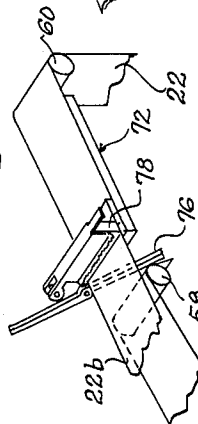
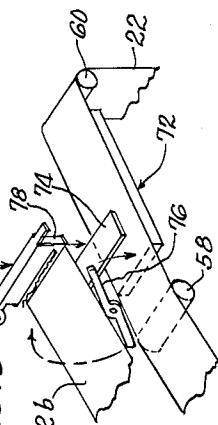


FIG. 3



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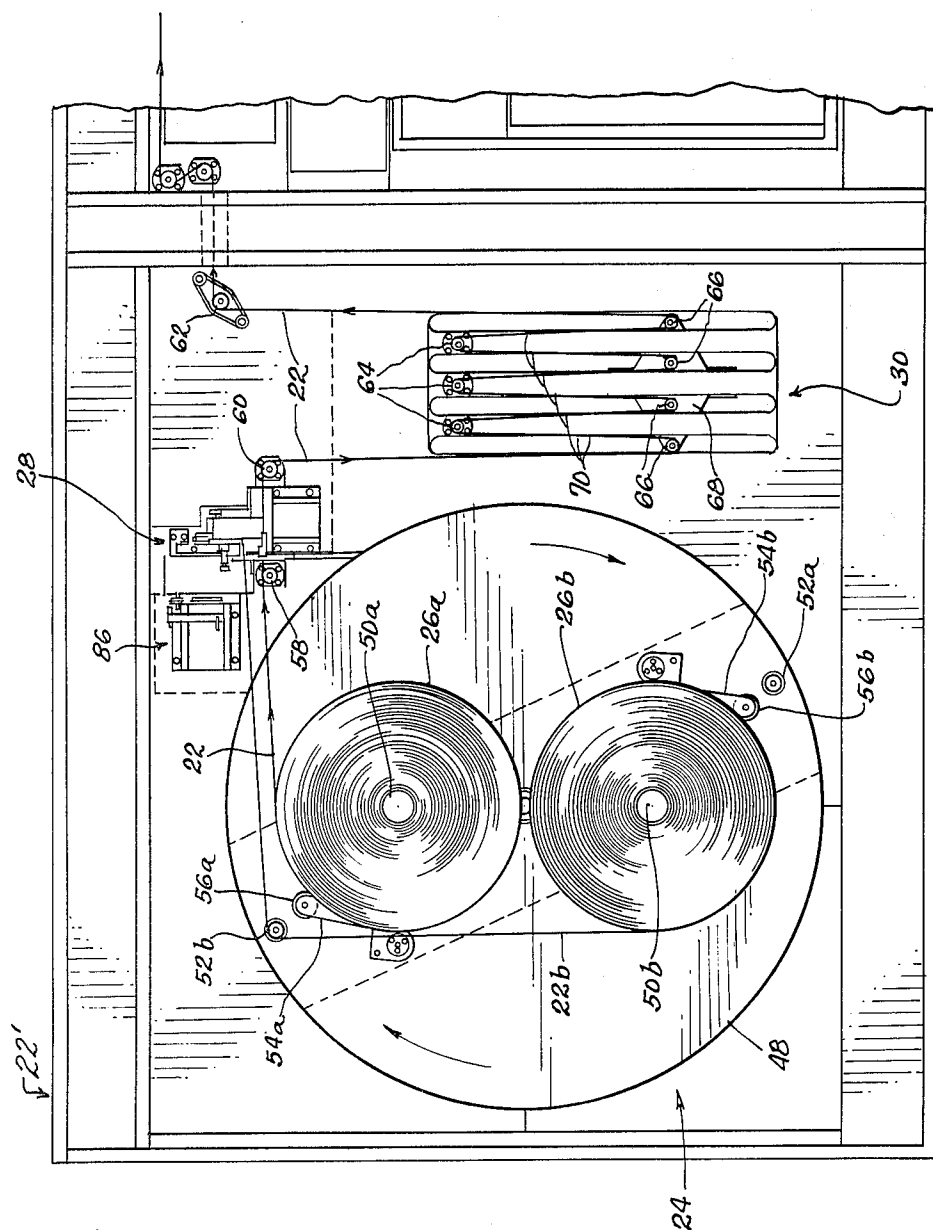


FIG. 5

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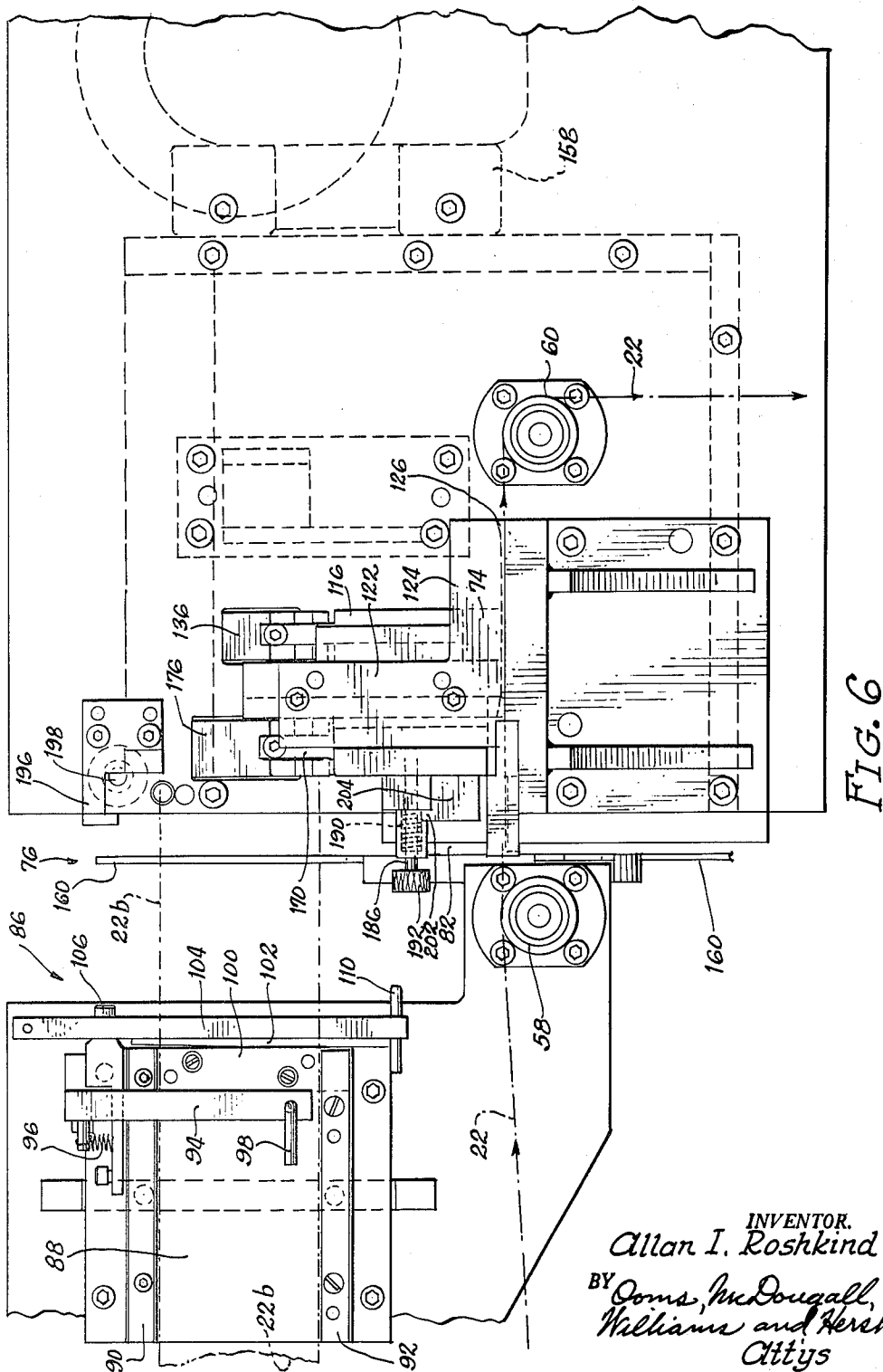
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WEB SPLICER

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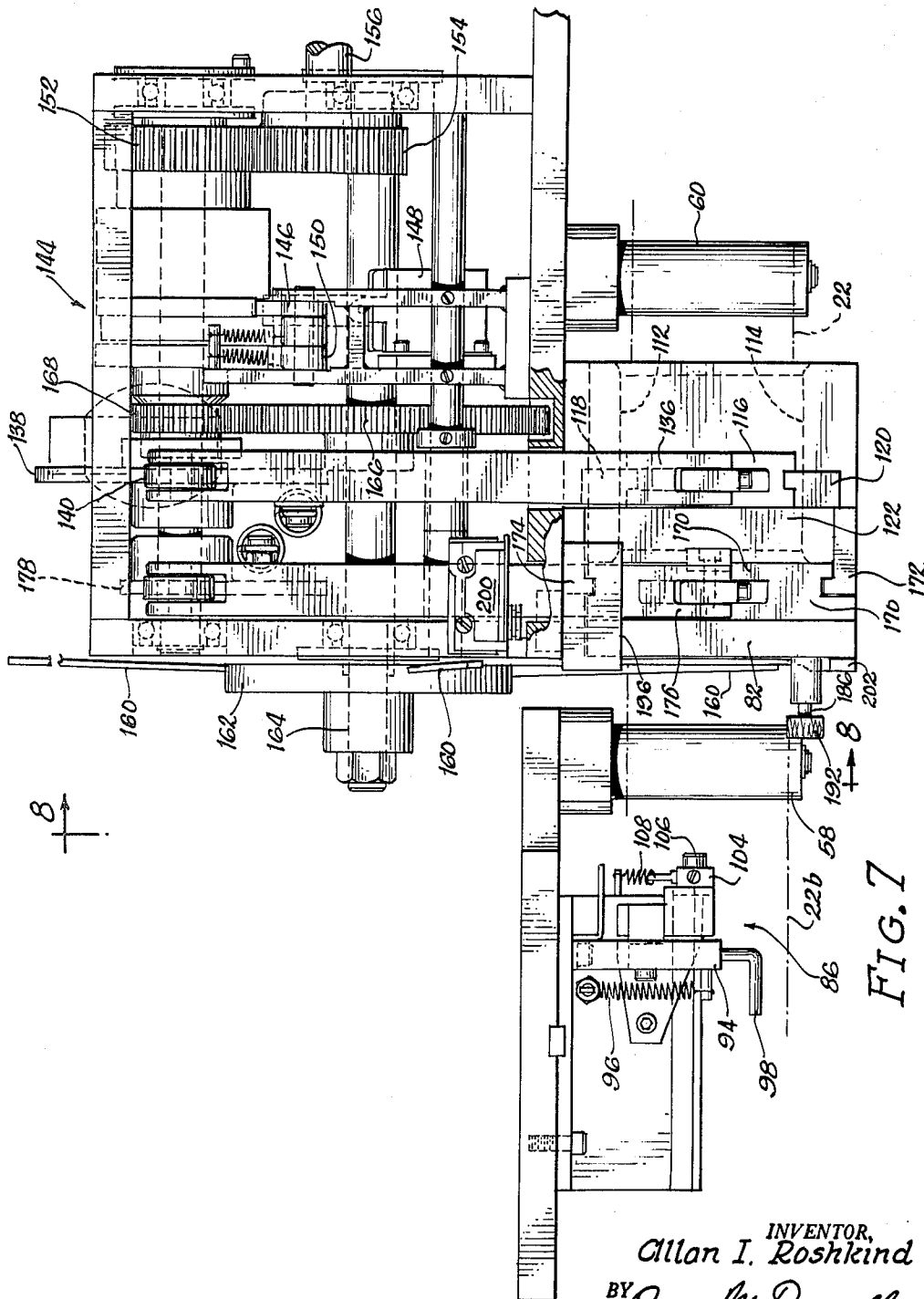
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WEB SPLIGER

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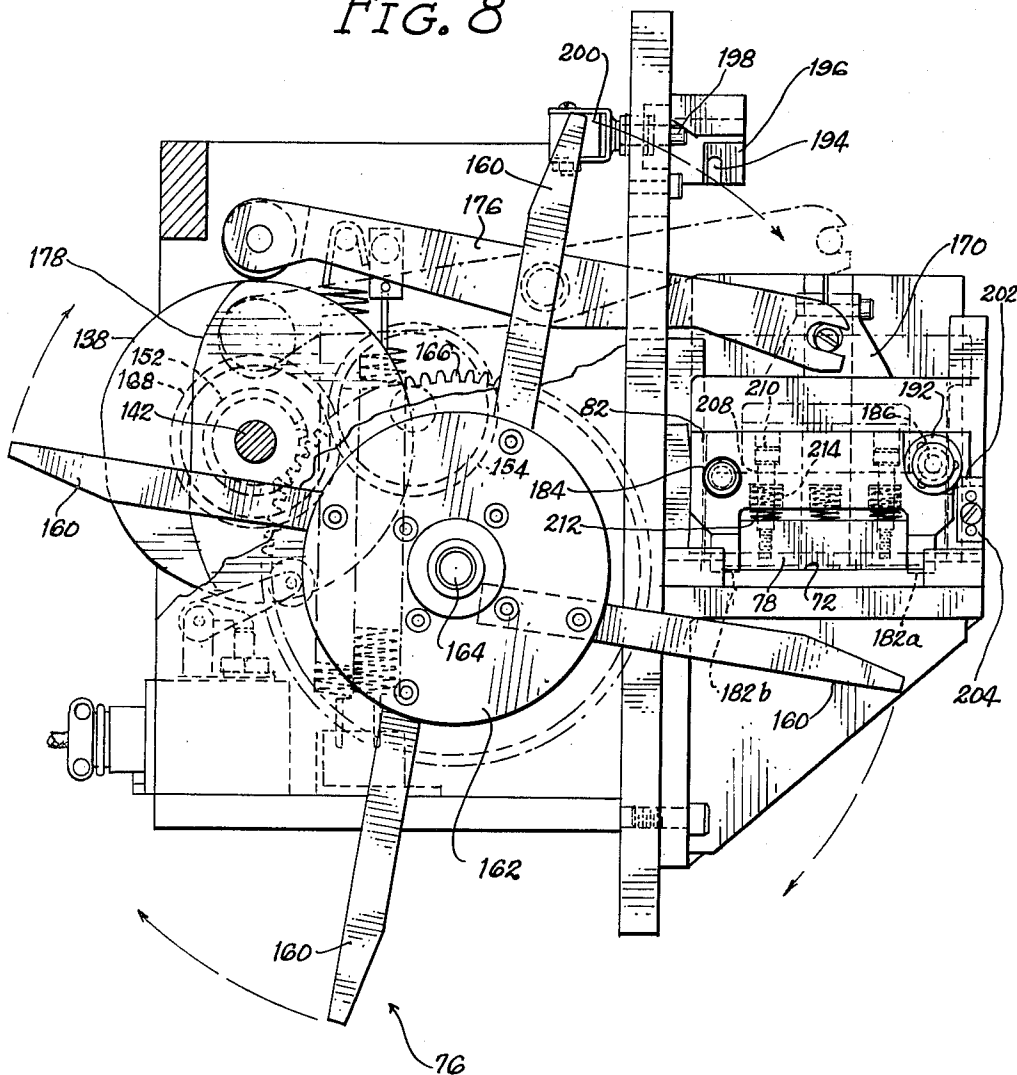
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FIG. 8



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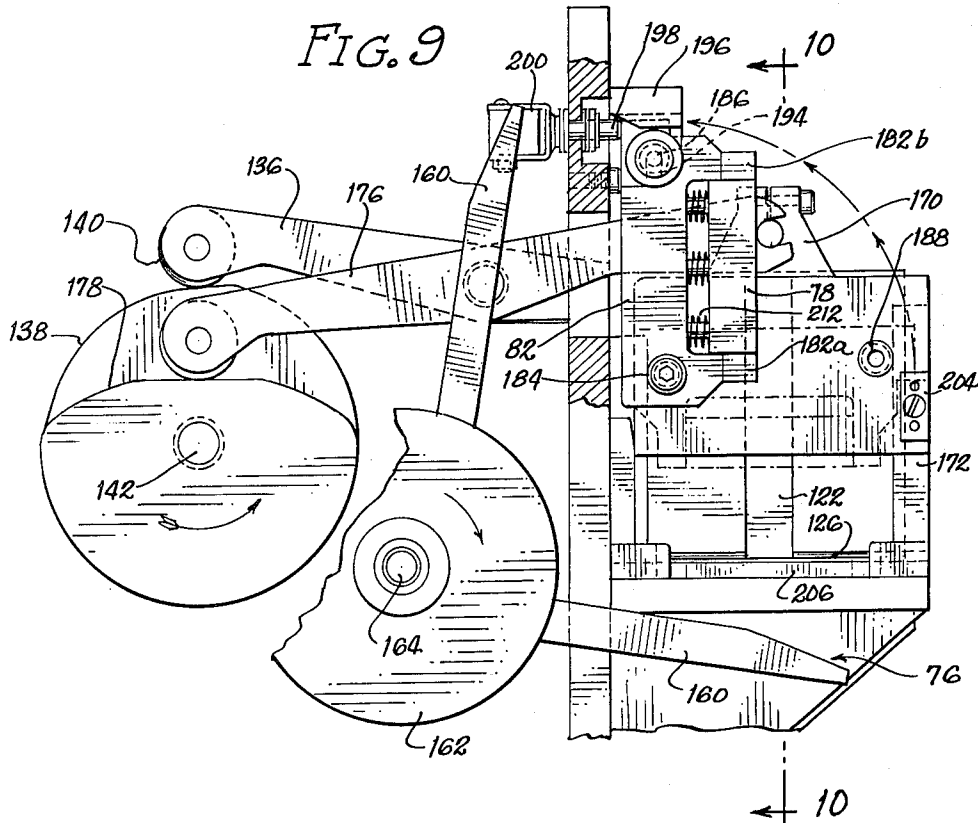
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WEB SPLICER

Filed March 24, 1961

7 Sheets-Sheet 6



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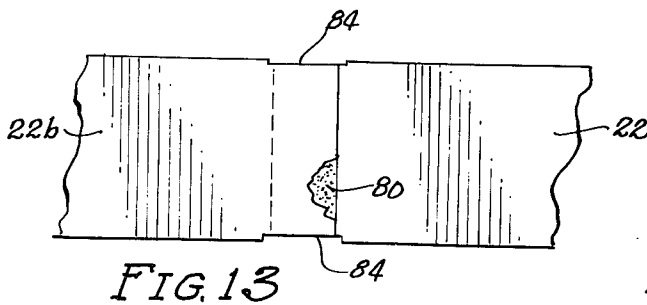
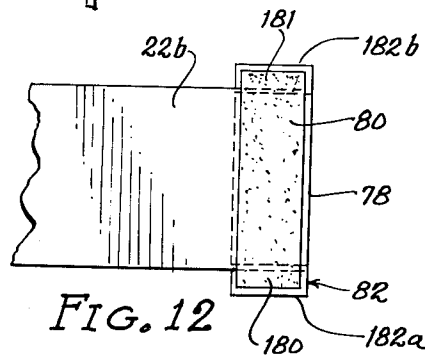
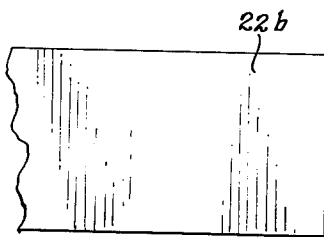
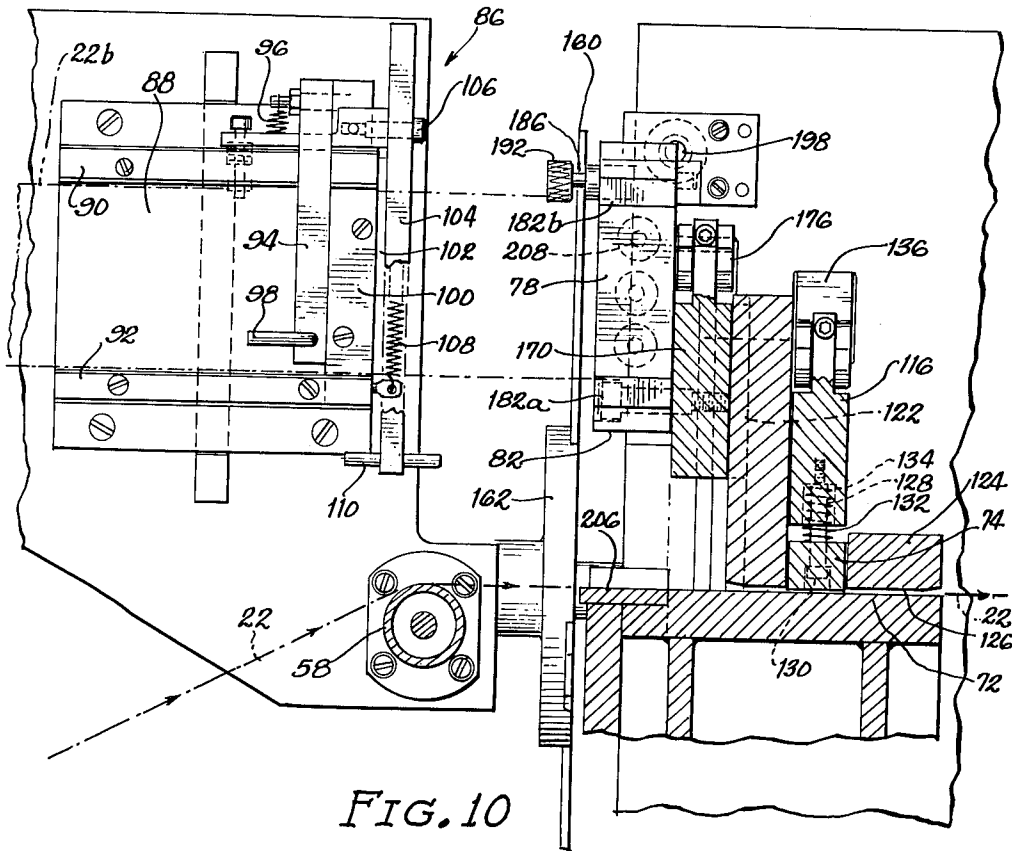
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WEB SPLICER

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WEB SPLICER

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Filed Mar. 24, 1961, Ser. No. 98,206
7 Claims. (Cl. 156—505)

This invention relates to machines for handling continuous webs made of paper or the like, and pertains particularly to a mechanism for splicing in a new web, wound on a new supply roll, without interrupting the operation of the machine.

One object of the present invention is to provide a new and improved splicing mechanism which automatically severs the old web from its supply roll and splices the leading end of the new web to the trailing end of the old web.

A further object is to provide a new and improved splicing mechanism which will find a wide variety of applications, but which is especially well adapted for use on a machine for electronically printing mailing labels on a continuous web in the form of a paper tape.

Another object is to provide a new and improved splicing mechanism in which the web is stopped momentarily, at a point adjacent the roll stand, while the new web is being spliced to the old web, but in which the movement of the web at the printing position is maintained, without any interruption, by providing a storage elevator which pays out the old web while the splice is being completed.

It is a further object to provide a new and improved splicer which is especially well adapted for the use of double sided adhesive tape for securing the new web to the old web, such tape being provided with adhesive coatings on both sides and being adapted to be sandwiched between the ends of the old and new webs.

Another object is to provide a new and improved splicing mechanism in which the double sided adhesive tape is also employed to hold the end of the new web in position, ready to make a splice, until the moment at which the splicing mechanism is actuated.

A further object is to provide a new and improved splicing mechanism having means for trimming off any excess of the double side adhesive tape.

It is a further object of the present invention to provide a new and improved web splicing mechanism which is capable of making splices very quickly, yet securely and with a high degree of precision.

Further objects and advantages of the present invention will appear from the following description, taken with the accompanying drawings, in which:

FIG. 1 is a general front elevational view of a label printing machine equipped with a web splicer to be described as an illustrative embodiment of the present invention.

FIG. 2 is a perspective view showing the web to be spliced, the web being shown in its final condition, with the mailing labels printed thereon and with locating perforations punched therein.

FIGS. 3 and 4 are diagrammatic perspective views showing two stages in the splicing of the webs.

FIG. 5 is an enlarged front elevational view corresponding to the left-hand portion of FIG. 1 and showing the web supply portion of the machine, comprising the stand or support for the supply rolls, the splicer, and the supply elevator or tension regulator.

FIG. 6 is a front elevational view to a still larger scale, showing details of the splicer.

FIG. 7 is a top plan view of the splicer, with certain parts broken away for clarity of illustration.

FIG. 8 is a side view showing details of the splicer,

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the view being taken generally along the line 8—8 in FIG. 7.

FIG. 9 is a fragmentary view similar to FIG. 8, but with certain parts broken away, and with the splicer in a different operating position.

FIG. 10 is an elevational sectional view, taken generally along the line 10—10 in FIG. 9.

FIG. 11 is a view showing the new web with its leading end trimmed square, ready to be spliced to the old web.

FIG. 12 is an elevational view showing the new web with the double sided adhesive tape applied thereto, and with the projecting ends of the adhesive tape stuck to the punch and presser unit.

FIG. 13 is a plan view showing the completed splice between the old and the new webs.

It will be seen that FIG. 1 illustrates a label printing machine 20 adapted to print mailing labels or the like on a paper web or tape 22. FIG. 2 illustrates the tape 22 in its final form, with mailing addresses 24' or the like printed thereon. Between the addresses 24', the tape 22 is punched with indexing holes 26'. It will be understood that the tape 22 may be cut off successively at each of the holes 26' to separate the tape into individual mailing labels, which may be applied to magazines or the like. Automatic machines (not shown) may be employed to cut the labels from the tape and to apply the labels to the magazines. The illustrated label printing machine 20 rewinds the tape or web 22, after it has been printed, to form rolls 28' which are severed from the web and taken off the machine 20 for subsequent use on the label cutting and applying machines.

In general, the label printing machine 20 comprises a supply unit 22' including a roll stand 24 adapted to hold two large supply rolls 26a and 26b of the paper tape 22. As shown in FIG. 1, the tape or web 22 is being unrolled from the roll 26a, while the roll 26b serves as a standby, to be used when the roll 26a is nearly exhausted. For clarity, the new web from the standby roll 26b will be designated 22b.

The supply unit 22' also comprises a splicer 28 which comes into play when the roll 26a is nearly exhausted. The splicer 28 then stops the movement of the web 22 momentarily, cuts off the old web 22, and splices the leading end of the new web 22b to the trailing end of the old web 22. The web is then released so that it resumes its normal travel through the machine.

After traveling through the splicer 28, the web 22 passes through a storage elevator 30 which regulates the tension on the web and makes it possible to stop the web momentarily at the splicer 28 while the movement of the web continues without interruption beyond the elevator 30.

From the supply elevator 30, the web 22 passes through a printing unit 32 which prints the addresses 24 or other material on the web. The labels may be printed in a variety of ways, but in this case the labels are printed at extremely high speed by an electronic facsimile printer 34 which produces an electrostatic image of each address on the tape, develops the image by dusting it with a powdered material, adapted to adhere to the electrostatic image, and fuses the powdered material so that it will adhere to the tape.

Next, the tape 22 passes through a punching unit 36 which forms the holes 26'. The tape then passes through another storage elevator 38 to a rewinding unit 40 which rewinds the printed tape to form the rolls 28'.

It will be seen that the rewinding unit 40 comprises a plurality of rewinding spindles 42 which are mounted on a rotatable indexing wheel 44. As each roll 28 is being

wound on one of the spindles 42, the web 22 passes around one of the adjacent spindles, which is thereby driven in the manner of a pulley. When the roll 28 is wound to the desired size, the roll is severed from the web 22 by a severing unit 46, which cuts off the web at the adjacent spindle. The leading end of the web is then wound around such adjacent spindle, and the wheel 44 is indexed so as to bring each spindle in turn into play. The completed roll of printed labels may then be removed from the corresponding spindle. Various features of the rewinding unit 40 are disclosed and claimed in my co-pending patent application, Serial No. 104,467, filed April 20, 1961, and thus will not be described in detail in this application. It will be understood that this invention is not concerned with the printing unit 32 and the punching unit 36, which may be of any known or suitable construction. These units will not be described in detail in this application.

The roll stand 24' comprises a rotatable indexing wheel 48 having two spindles or shafts 50a and 50b thereon for supporting the supply rolls 26a and 26b. It will be seen that the web 22 is being pulled off the roll 26a on the upper spindle 50a, and that the standby roll 26b is on the lower spindle 50b. When the standby web 22b is spliced to the web 22 by the splicer 28, the wheel 48 is indexed through one-half revolution to bring the spindle 50b to the uppermost position. A full roll is then placed on the spindle 50a to serve as a standby, in preparation for another splice. The wheel 48 is provided with guide rollers 52a and 52b around which the standby web is threaded between the standby roll and the splicer 28. Thus, the standby web 22b passes upwardly, around the roller 52b and in a generally horizontal direction to the splicer 28. The roller 52b positions the web 22b so that it will not come into engagement with the roll 26a or the web 22 until the splice is made. When the wheel 48 is indexed, the roller 52a is disengaged from the web.

To maintain the proper tension on the web 22, the spindles 50a and 50b may be provided with brakes (not shown) which may be controlled by arms 54a and 54b having rollers 56a and 56b thereon, engaging the rolls 26a and 26b. The braking effort on the spindle 50a is regulated by the position of the arm 54a so as to maintain substantially uniform tension on the web 22. The braking effort may also be regulated by the position of the storage elevator 30. Tension regulators of this type are known to those skilled in the art and need not be described in greater detail.

The splicer 28 includes two rollers 58 and 60 over which the web 22 passes. From the roller 60, the web 22 travels downwardly to the elevator 30. After passing through the elevator 30, the web travels upwardly around a guide roller 62.

It will be seen that the illustrated elevator 30 comprises a plurality of upper rollers 64, which are rotatable but not translatable, and a plurality of lower rollers 66 which are translatable mounted on a vertically slidable carriage 68. In this case there are four of the lower rollers 66 and three of the upper rollers 64. The web 22 is lopped back and forth around the upper and lower rollers 64 and 66, passing first around each of the lower rollers and then around each of the upper rollers in turn. Thus, the web travels in a plurality of generally vertical flights 70 between the upper and lower rollers 64 and 66. It will be apparent that a considerable length of the web 22 may be stored in the elevator 30. The stored web may be paid out by raising the lower rollers 66 and thus shortening the flights 70.

The tension on the web 22 tends to raise the lower rollers 66, which may be biased downwardly by gravity and also by spring action, if desired. Thus, the position of the lower rollers 66 may be employed to regulate the tension in the web. As already indicated, the tension may be regulated by varying the braking effort on

the spindle 50a in response to upward and downward movement of the rollers 66.

When the web 22 is stopped momentarily by the splicer 28, the web is paid out from the elevator 30, so that the normal movement of the web is maintained through the printing unit 32. Thus, the splice may be accomplished without any interruption in the operation of the printing unit.

FIGS. 3 and 4 illustrate the general operation of the splicer in a diagrammatic manner. It will be seen that the web 22 passes over a flat guide or bed 72 which is disposed in the space between the guide rollers 58 and 60. When the splice is to be made, the web 22 is stopped momentarily by means of a clamping bar or member 74 which presses the web against the bed 72. The web 22 is then severed by means of a rotary knife 76 which cuts the web 22 adjacent the guide roller 58 and at one end of the bed 72. Next, a presser pad or member 78 is moved downwardly to press the leading end of the new web 22b against the severed trailing end of the old web 22, as shown in FIG. 4. The new web 22b is stuck to the old web 22 by an adhesive member 80 (FIG. 12) previously applied to the leading end of the new web. The adhesive member 80 may simply comprise a coating of adhesive material applied to the under side of the new web, or may take various other forms, but preferably is in the form of a piece of double sided adhesive tape, having pressure sensitive adhesive on both sides thereof. The excess tape may be trimmed away by means of a punch 82 (FIG. 12), leaving the tape 22 with shallow notches 84 in the edges thereof at the splice, as shown to advantage in FIG. 13.

In preparation for the splicing operation, the leading end of the new web 22b should be trimmed square. To facilitate this operation, the illustrated splicer 28 is provided with a trimming device 86, comprising a generally vertical board or plate 88 against which the new web 22b is placed.

Upper and lower guide bars 90 and 92 (FIG. 10) are mounted on the plate 88 to locate the edges of the web 22b. For convenience, the web 22b may be pressed against the plate 88 by means of a swingable arm 94 which is biased against the plate 88 by means of a spring 96. A handle 98 may be provided on the lower end of arm 94 for convenience in lifting the arm away from the plate 88.

The web 22b is adapted to be trimmed by shearing knives 100 and 102. The knife 100 is stationary and is mounted along the right-hand edge of the plate 88. It will be seen that the knife 102 is mounted on an arm 104 which is swingable about a pivot 106 and is counterbalanced by a spring 108. An operating handle 110 is provided on the lower end of the arm 104. After the web 22b has been trimmed square, the double sided adhesive tape 80 is applied to the trimmed edge portion of the web.

Guiding edges or bars 112 and 114 are provided along the upper surface of the bed 72 to guide the edges of the running web 22. The clamping bar or member 74 is mounted on the lower end of a vertically movable slider 116. It will be seen from FIG. 7 that the slider 116 is movable along front and rear guides 118 and 120 and a side guide 122. An additional side guide 124 is provided on the opposite side of the clamping bar 74, as shown in FIG. 10. The side guides 122 and 124 are spaced above the bed 72 so as to provide a narrow slot 126 through which the web 22 is guided.

The clamping bar 74 is resiliently mounted on the slider 116 so as to be adapted to yield and apply spring pressure when the clamping bar is moved downwardly into clamping engagement with the web 22. Thus, the clamping bar 74 is connected to the slider 116 by a plurality of guide pins 128 which are threaded into the lower end of the slider. The clamping bar 74 is slidably mounted on the guide pins and is retained thereon by

enlarged heads 130 which are formed on the lower ends of the guide pins. Coil springs 132 are received around the guide pins 128 and are compressed between the clamping bar 74 and the slider 116. The upper ends of the springs 132 are received in counterbores 134 formed in the slider 116. The springs 132 and the guide pins 128 provide for overtravel of the slider 116 when it is moved downwardly to clamp the web 22 between the clamping bar 74 and the bed 72.

As shown to advantage in FIG. 7, the slider 116 is adapted to be reciprocated vertically by a rocker arm or lever 136 which is operated by a cam 138. A roller 140 is mounted on the rear end of the lever 136 to ride on the cam 138, as shown to best advantage in FIG. 9.

It will be seen that the cam 138 is mounted on a shaft 142 which is driven by a single revolution clutch 144, having a trip lever 146 adapted to be operated by a solenoid 148. When the solenoid 148 is energized, the clutch 144 drives the shaft 142 through one complete revolution, whereupon the shaft is stopped by a lever 150. Single revolution clutches of this type are well known to those skilled in the art, so that it will not be necessary to describe the clutch in further detail.

The clutch 144 is driven by a continuously rotating gear 152 which meshes with a drive gear 154 secured to a shaft 156. When the splicer is in operating condition, the shaft 156 is continuously rotated by a motor 158.

After the web 22 is stopped by the clamping bar 74, (FIGS. 3 and 6) the web is severed by the knife 76, as already indicated. As shown to advantage in FIG. 8, the illustrated knife 76 has four blades 160 which are mounted on a hub 162 secured to a shaft 164. A gear 166 is mounted on the shaft 164, as shown to advantage in FIG. 7. The gear 166 meshes with a smaller gear 168 secured to the cam shaft 142. The gears 166 and 168 reduce the speed of the shaft 164 so that it rotates through only 90 degrees while the cam shaft 142 is rotated through one revolution. Thus, each of the four blades 160 shears off the web in turn during successive cycles of the splicer.

As already indicated, the new web 22b is placed against the old web 22 by a presser pad or member 78, so that the double-sided adhesive tape 80 will cause the new web to adhere to the old web. The excess tape is trimmed away by a punch 82. The presser pad 78 and the punch 82 are mounted on a second slider 170 which is movable vertically along the guide 122, on the opposite side thereof from the guide 116. The slider 170 is confined between front and rear guides 172 and 174. It will be seen from FIG. 8 that the slider 170 is adapted to be reciprocated vertically by a rocker arm or lever 176 operable by a cam 178 which is secured to the cam shaft 142.

It is preferred to employ the double-sided adhesive tape 80 to secure the leading end of the new web 22b to the lower faces of the presser pad 78 and the punch 82, in preparation for making the splice. Thus, the tape 80 is cut to a length somewhat greater than the width of the web 22b, so that the tape 80 will have end portions 180 and 181 extending beyond the edges of the web 22b, as shown in FIG. 12. These end portions 180 and 181 are stuck to the punch 82 by the operator. It will be seen that the punch 82 has two cutting portions 182a and 182b on the opposite ends of the presser pad 78. The end portions 180 and 181 of the tape 80 are stuck to the portions 182a and 182b.

To make it easy to stick the web 22b to the punch 82, the slider 170 is arranged so that the punch 82 and the presser pad 78 may be swung upwardly on the slider to a vertical position, as shown in FIGS. 9 and 10. Thus, the punch 82 is swingable about a pivot pin 184 which is threaded into the slider 170. A slidable pin or plunger 186 is employed to latch the punch in its two positions. When the punch 82 is in its operative or horizontal position, the plunger 186 is engaged with a latching hole 188

in the slider 170. The plunger 186 is biased into the hole 188 by a spring 190 (FIG. 6). A handle or head 192 is provided on the outer end of the plunger 186 so that the plunger may readily be withdrawn from the hole 188. When the punch 82 is swung upwardly to its vertical position, the plunger 186 is engageable with a latching slot 194 in a stationary member 196. When the punch 82 is latched in this position, it engages a switch plunger 198 and operates a switch 200 which prevents the splicer from operating. Thus, the operator can stick the web 22b to the punch 82 without any danger that he will be injured by unexpected movement of the punch 82 or the knife blades 160.

When the punch 82 is swung downwardly to its operative position, the outer end of the punch is held against the slider 170 by an overhanging lip 202 on a guide member 204, secured to the slider. The punch 82 is thus solidly secured to the slider 170. The cutting portions 182a and 182b of the punch are adapted to shear away the excess portions of the double-sided adhesive tape 80, while forming the notches 84 in the edges of the web. The cutting portions 182a and 182b are in shearing relation to a die plate 206 set into the upper face of the bed 72.

It will be seen from FIGS. 8 and 9 that the presser pad 78 is resiliently connected to the punch 82 so as to be adapted to yield when the presser pad is brought into clamping relation with the web by the downward movement of the punch. Thus, the presser pad 78 is connected to the punch 82 by means of guide pins 208 which are slidable in the punch and are threaded into the presser pad. An enlarged head 210 is formed on each of the pins 208 to retain the presser pad 78 on the punch 82. Coil springs 212 are positioned around the pins 208 and are compressed between the punch 82 and the presser pad 78. The upper ends of the springs 212 are recessed into counterbores 214 formed in the punch 82.

It may be helpful to summarize the operation of the splicer 28 and the associated components of the label printing machine 20. To prepare for the splicing operation, the operator places the new roll 26b on the spindle 50b and brings the new web 22b upwardly over the guide roller 52b. He then places the end of the new web 22b between the guides 90 and 92 on the trimming board 88 and raises the clamping arm 96 so that the end of the web can be slipped under the arm. The arm 96 is then lowered to retain the web on the board 88. The end of the web 22b is then trimmed square by operating the knife 102.

Next, the double-sided adhesive tape 80 is stuck to the underside of the leading edge of the web, as shown in FIG. 12. The projecting end portions 180 and 181 of the adhesive tape 80 are employed to secure the web 22b to the punch 82, which is swung to its vertical position, as shown in FIG. 9, to facilitate this operation. When the punch 82 is in its vertical position, it operates the switch 200 and prevents the splicer from operating.

The plunger 186 is then disengaged from the slot 194 so that the punch can be swung downwardly into its horizontal position, shown in FIG. 8. The plunger 186 is latched into the hole 188 in the slider 170. The splicer is now fully prepared for the splicing operation.

When the roll 26a is nearly exhausted, the motor 158 of the splicer is started. The operation of the splicer is then initiated by energizing the solenoid 148. This may be done automatically under the control of the arm 54a, which moves inwardly as the roll 26a is unwound. The operation of the solenoid 148 causes the clutch 144 to drive the cam shaft 142 through one revolution. The cams 138 and 178 rotate with the shaft 142. The cam 138 operates the lever 136 and thereby moves the slider 116 downwardly to bring the bar 74 into clamping engagement with the web 22. The springs 132 provide for slight downward overtravel of the slider 116, while maintaining firm spring pressure on the web 22.

The action of the clamping bar 74 stops the web 22 momentarily while the splice is being made. However,

the normal movement of the web is maintained through the printing unit 32. This is made possible by the storage elevator 30, which pays out the web while the web is stopped at the splicer 28. As the web is paid out, the lower rollers 66 of the elevator 30 are raised.

Shortly after the web 22 is stopped by the clamping bar 74, the web is cut off by one of the blades 160 of the knife 76, which is rotated through 90 degrees while the cam shaft 142 is being rotated through the one revolution.

The cam 178 operates the lever 176 and thereby moves the slider 170 and the punch 82 downwardly. The presser pad 78 moves downwardly with the punch 82 and presses the new web 22b against the old web 22, with the double-sided-adhesive tape 80 therebetween. The springs 212 provide for downward overtravel of the punch 82 so that the punch can shear away the excess end portions of the adhesive tape, leaving the notches 84 in the web at the splice. The punch 82 and the presser pad 78 are then retracted upwardly.

When the splice has thus been completed, the clamping bar 74 is moved upwardly to release the web, so that it can resume its normal movement. The splicer operates quickly so the web needs to be stopped for only a fraction of a second.

The wheel 48 is then indexed in a clockwise direction through 180 degrees, to bring the new roll 26b to the uppermost position occupied by the old roll 26a in FIG. 1. The small remaining portion of the roll 26a may then be removed from the spindle 60a and may be replaced with a full roll.

It will be evident that the splice is accomplished very quickly and positively, without interrupting the normal movement of the web through the printing unit 32. Thus, the label printing machine may be operated for an indefinite period without any necessity to shut down the machine for splicing in a new supply roll. Thus, full utilization of the speed of the machine is realized.

Various modifications, alternative constructions and equivalents may be employed without departing from the true spirit and scope of the invention, as exemplified in the foregoing description and defined in the following claims:

I claim:

1. In a printing machine, the combination comprising a roll stand having means for supporting a supply roll of a web to be printed, said roll stand also comprising means for supporting a standby roll of a standby web, means for guiding the first mentioned web off the supply roll, a web tensioning elevator for receiving and passing on the first web, said elevator comprising first and second relatively movable sets of rollers, said first web being looped back and forth between said rollers of said first and second sets, and a splicing mechanism between said supply roll and said elevator and comprising a guiding bed for receiving the first web, a clamping member for clamping the first web against said bed so as to stop the movement of said first web, said elevator providing for the continuation of the movement of said first web beyond said elevator while said first web is paid out by said elevator, means including a first cam for operating said clamping member, a cam shaft for rotating said first cam, means for rotating said cam shaft through one revolution, a rotary knife operable by said cam shaft for severing the first web adjacent said bed, a slider movable toward and away from said bed opposite the severed end of said first web, means including a second cam connected to said cam shaft for reciprocating said slider, a punch mounted on said slider, a pressing member resiliently mounted on said punch for pressing the standby web against the severed end of the first web with an adhesive strip therebetween, cutting means on said punch for trimming away the end portions of said adhesive strip from said webs, said end portions of said adhesive strip being employed initially for securing the end of

said standby web to said cutting portions of said punch, and means mounting said punch on said slider for swinging movement to an accessible position to provide for the attachment of said standby web and said adhesive strip to said punch.

2. In a mechanism for splicing in a new web to an old running web, the combination comprising braking means for momentarily stopping the old running web, means for severing the old web, a slider movable toward and away from the severed end of the old web, means for reciprocating said slider through one cycle, a punch mounted on said slider, a pressing member resiliently mounted on said punch for pressing the leading end of the new web against the severed trailing end of the old web with a double-sided adhesive strip therebetween, said punch having cutting portions for trimming away the end portions of said adhesive strip from said webs, said end portions of said adhesive strip being employed initially for securing the end of the new web against said punch and said pressing member, and means mounting said punch and said pressing member on said slider for movement thereon to an accessible position to provide for the application of said adhesive strip to said punch.

3. In a mechanism for splicing in a new web to an old running web, the combination comprising a guide bed for receiving the old running web, a clamping member adjacent said bed, means including a cam for moving said clamping member toward and away from said bed and into engagement with the running web for clamping the running web momentarily against said bed and thereby stopping the running web, a rotatable shaft supporting said cam, means for rotating said shaft through one revolution, a rotary knife for severing the old web adjacent one end of said bed, means connected between said shaft and said rotary knife for rotating said knife through a predetermined angle when said shaft is rotated through one revolution, a slider movable toward and away from said bed opposite the severed end of said old web, means including a second cam secured to said shaft for reciprocating said slider, a punch and a pressing member mounted on said slider for pressing the leading end of the new web against the severed end of the old web with an adhesive strip therebetween, said punch having cutting portions for trimming away the end portions of said adhesive strip, said end portions of said adhesive strip being employed initially to secure the end of the new web to said cutting portions of said punch, means mounting said punch and said pressing member on said slider for swinging movement to an accessible position for the application of the new web and the adhesive strip to said pressing member and said punch, first catch means for retaining said pressing member and said punch in said accessible position, and second catch means for retaining said pressing member and said punch in their normal operative positions over said bed.

4. In a mechanism for splicing in a new web to an old running web, the combination comprising braking means for momentarily stopping the old running web, means for severing the old web, a member movable toward and away from the severed end of the old web, means for reciprocating said member through one cycle, a punch mounted on said member, a pressing element having a resilient lost-motion connection to said punch for pressing the leading end of the new web against the severed trailing end of the old web with a double-sided pressure-sensitive adhesive strip therebetween, said lost-motion connection providing for overtravel of said punch beyond said pressing element, said punch having cutting portions for trimming away the end portions of said adhesive strip from said webs, and stationary cutting elements on the opposite side of said old web from said punch, said cutting portions of said punch being movable into shearing relation to said cutting elements, said end portions of said adhesive strip being employed initially for securing the end of the new web against said punch

and said pressing member, said punch having end surfaces adjacent said cutting portions and initially flush with said pressing element for receiving the end portions of the adhesive strip.

5. In a mechanism for splicing in a new web to an old running web, the combination comprising a bed for supporting the old web braking means for momentarily stopping the old running web, driving means for actuating said braking means, means for operating said driving means through a single cycle, means operable by said driving means for severing the old web, a carriage movable toward and away from the severed end of the old web, means operable by said driving means for reciprocating said carriage, a pressing member having a resilient lost-motion connection to said carriage for pressing the leading end of the new web against the severed trailing end of the old web with a double sided pressure-sensitive adhesive strip therebetween, and a punch mounted on said carriage and having cutting portions for trimming away the end portions of said adhesive strip from said webs, said lost-motion connection providing for overtravel of said punch beyond said pressing member while said webs are pressed against said bed by said pressing member, and cutting elements on said bed and on the opposite side of said webs from said punch, said cutting portions of said punch being movable into shearing relation to said cutting elements, said end portions of said adhesive strip being employed initially for securing the end of the new web against said punch and said pressing member, said punch having end surfaces adjacent said cutting portions and initially flush with said pressing member for receiving the end portions of the adhesive strip.

6. In a mechanism for splicing a new web to an old running web, the combination comprising a guiding bed for receiving the old web, a clamping member for clamping the old web against said bed so as to stop the movement of said old web, means including a first cam for operating said clamping member, a cam shaft for rotating said first cam, means for rotating said cam shaft through one revolution, a rotary knife operable by said cam shaft for severing the old web adjacent said bed, a carriage movable toward and away from said bed opposite the severed end of said old web, means including a second cam connected to said cam shaft for reciprocating said carriage, a punch mounted, on said carriage, a pressing member having a resilient lost-motion connection to said punch for pressing the new web against the severed trailing end of the old web with a double-sided pressure sensitive adhesive strip therebetween, cutting means on said punch for trimming away the end portions of said adhesive strip from said webs, said lost-motion connection providing for overtravel of said punch beyond said pressing member, cutting elements on said bed and on the opposite side of said webs from said punch, said cutting means on said punch being movable into shearing relation to said cutting elements, said end portions of

said adhesive strips being employed initially for securing the end of said new web to said cutting portions of said punch, said punch having end surfaces adjacent said cutting means and initially flush with said pressing member for receiving the end portions of the adhesive strip, and means mounting said punch on said carriage for movement to an accessible position to provide for the attachment of said new web and said adhesive strip to said punch.

7. In a mechanism for splicing in a new web to an old running web, the combination comprising a guide bed for receiving the old running web, a clamping member adjacent said bed, means including a cam for moving said clamping member toward and away from said bed and into engagement with the old web for clamping the old web momentarily against said bed and thereby stopping the old web, a rotatable shaft supporting said cam, means for rotating said shaft through one cycle, means operable by said shaft for severing the old web adjacent one end of said bed, a carriage movable toward and away from said bed opposite the severed end of said old web, means including a second cam secured to said shaft for reciprocating said carriage, a pressing member for pressing the leading end of the new web against the severed end of the old web with a double sided pressure-sensitive adhesive strip therebetween, lost-motion resilient connecting means mounting said pressing member on said carriage to provide for overtravel of said carriage when said pressing member is arrested by engagement with the new web, a punch mounted on said carriage and having cutting portions for trimming away the end portions of said adhesive strip, cutting means on said bed for cooperating with said cutting portions on said punch, said cutting portions on said punch being movable into shearing relation with said cutting means on said bed during the overtravel of said carriage, said end portions of said adhesive strip being employed initially to secure the end of the new web to said cutting portions of said punch, said punch having end surfaces adjacent said cutting means and initially flush with said pressing member for receiving the end portions of the adhesive strip, and means on said carriage supporting said punch and said pressing member for movement to an accessible position for the attachment of the new web and the adhesive strip to said punch.

References Cited by the Examiner

UNITED STATES PATENTS

2,060,906	11/1936	Snyder	156—157 X
2,487,421	11/1949	Calder	156—157 XR
2,606,136	8/1952	Garrett	156—504
3,075,572	1/1963	Catozzo	156—505

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