Dec. 30, 1930. A. ROSENTHAL 1,786,867

LABEL PRINTING, FEEDING, AND CUTTING MACHINE

Filed Jan. 10, 1929 4 Sheets-Sheet 1

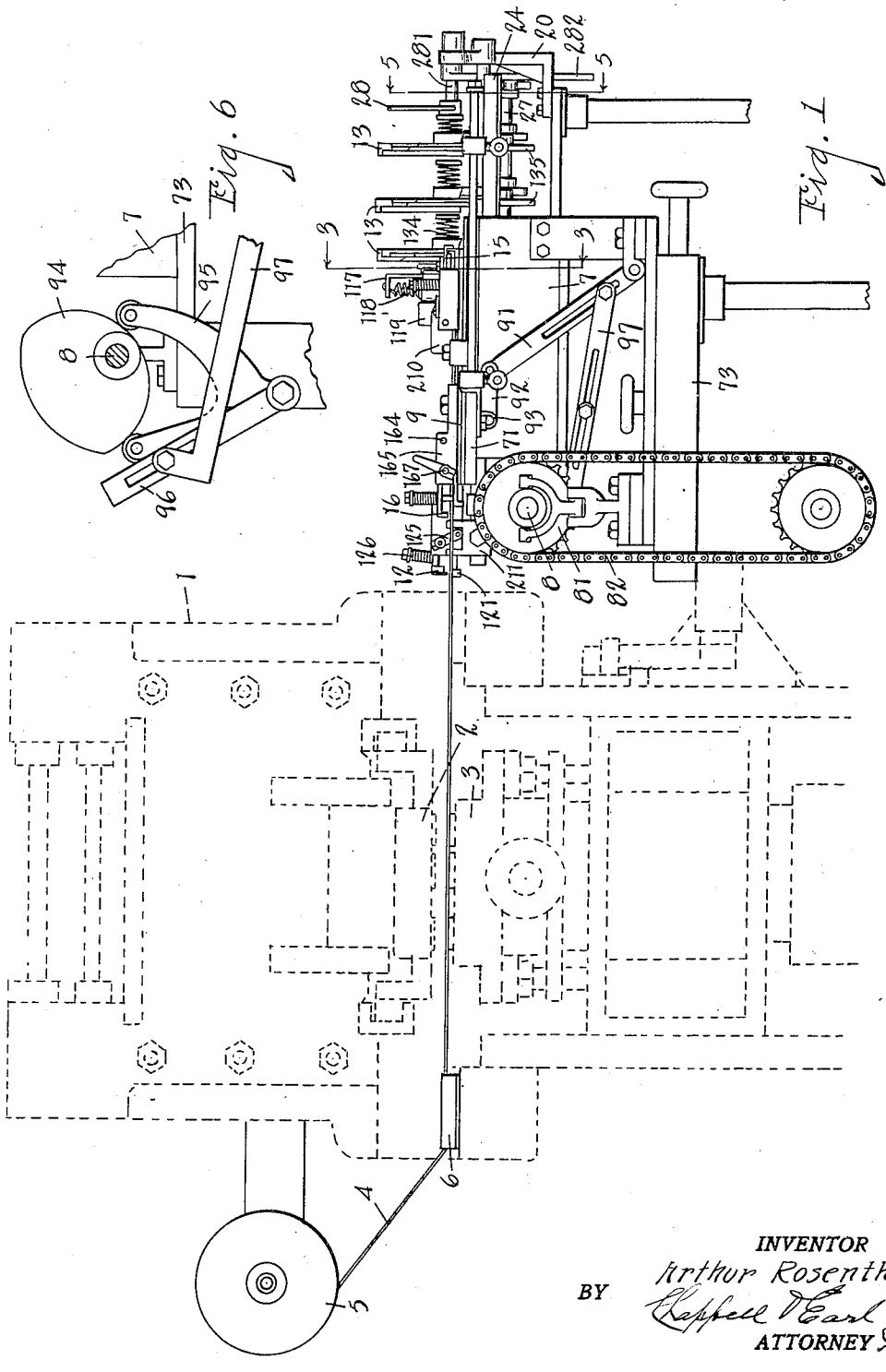


Fig. 1

Fig. 6

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Dec. 30, 1930. A. ROSENTHAL 1,786,867

LABEL PRINTING, FEEDING, AND CUTTING MACHINE

Filed Jan. 10, 1929 4 Sheets-Sheet 2

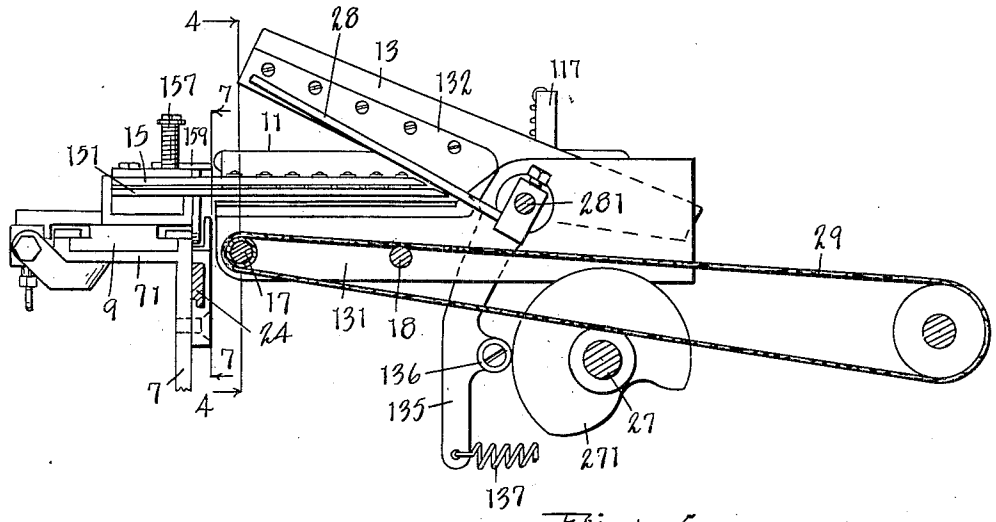


Fig. 5

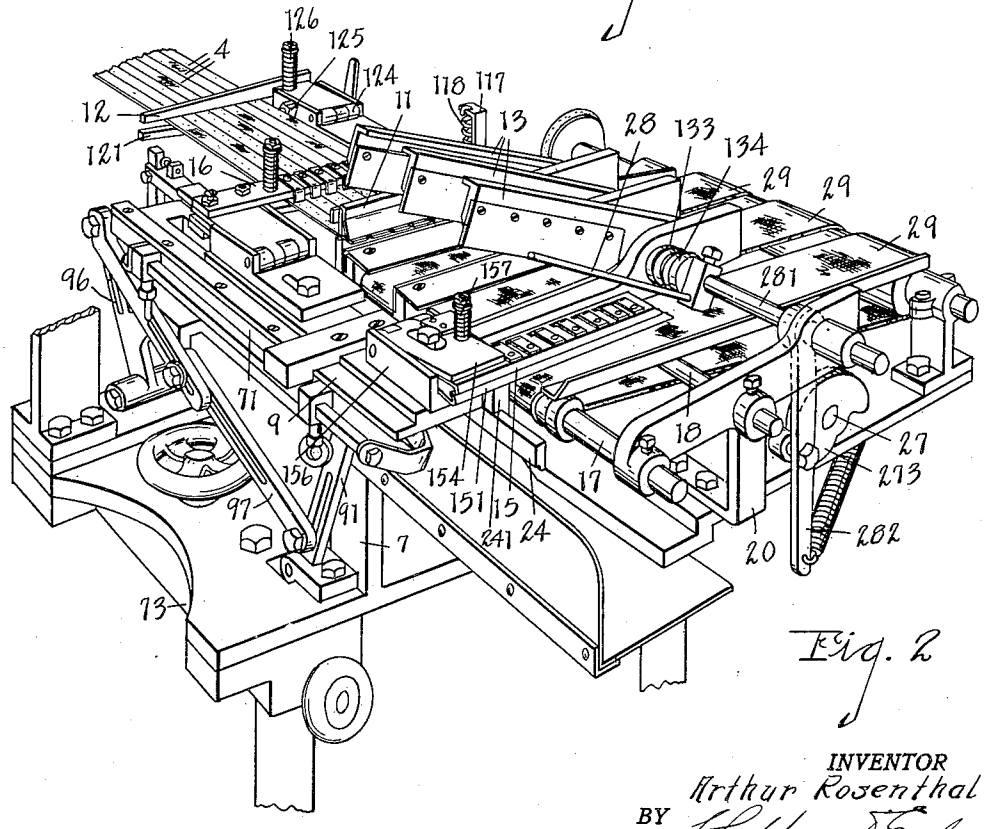


Fig. 2

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Dec. 30, 1930. A. ROSENTHAL 1,786,867

LABEL PRINTING, FEEDING, AND CUTTING MACHINE

Filed Jan. 10, 1929 4 Sheets-Sheet 3

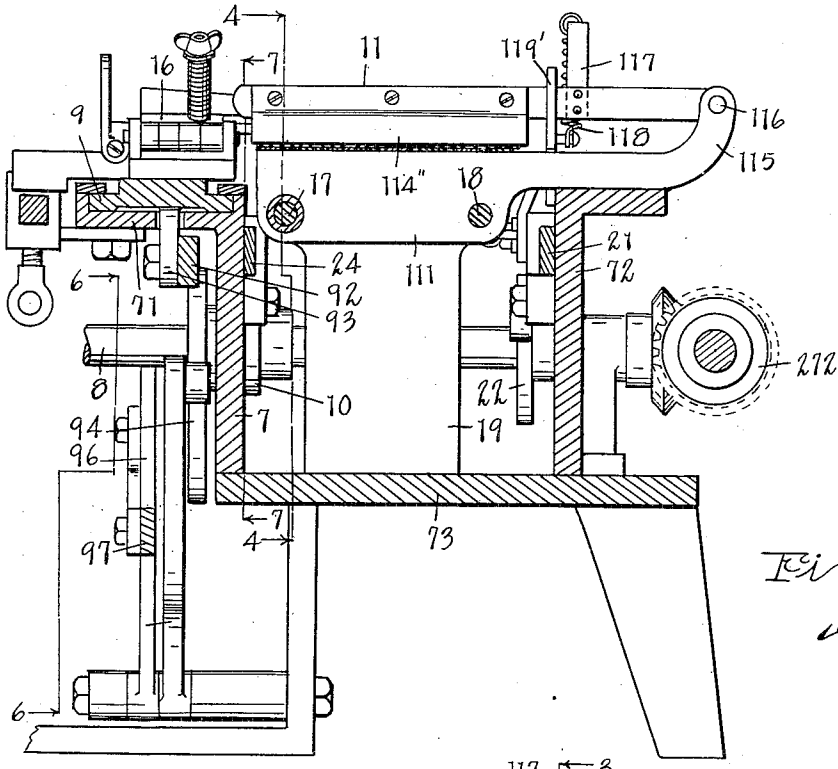


Fig. 3

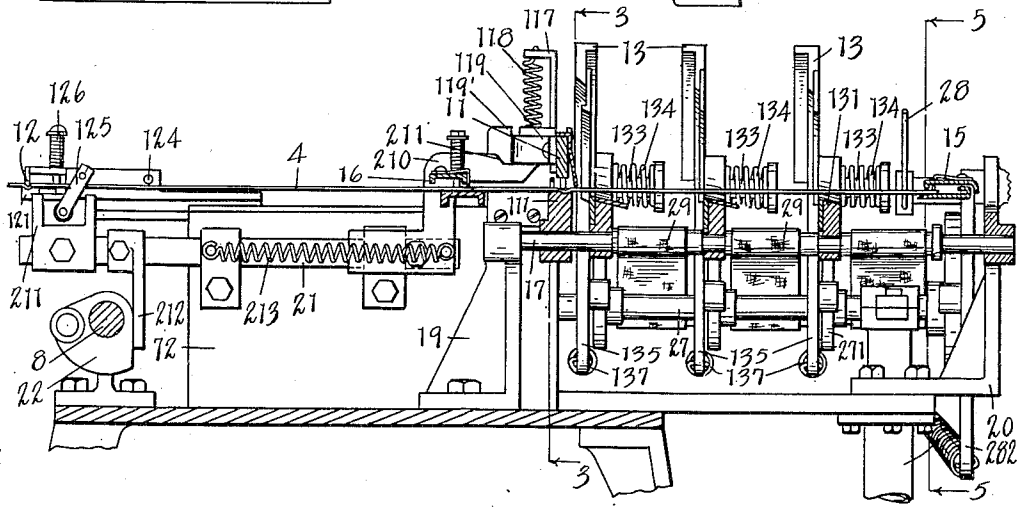


Fig. 4

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Dec. 30, 1930. A. ROSENTHAL 1,786,867

LABEL PRINTING, FEEDING, AND CUTTING MACHINE

Filed Jan. 10, 1929 4 Sheets-Sheet 4

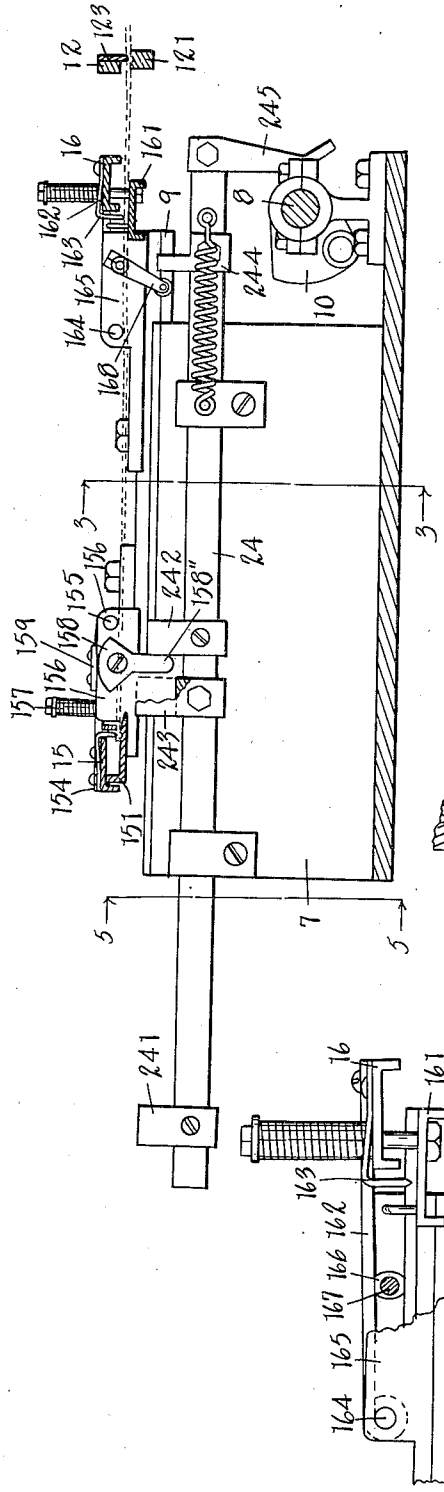


Fig. 7

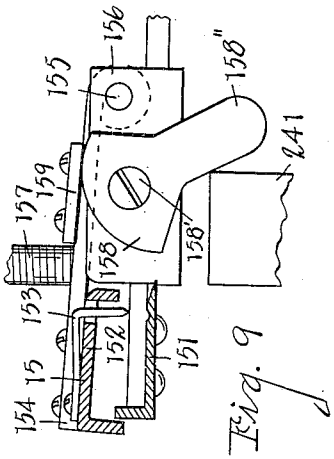


Fig. 9

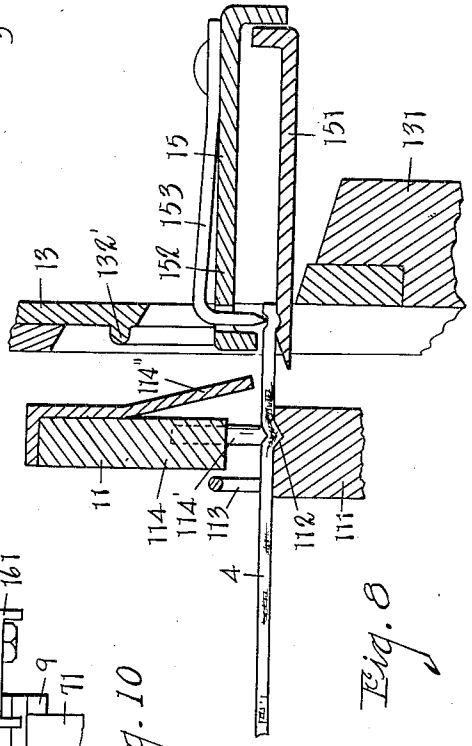


Fig. 8

Fig. 10

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Patented Dec. 30, 1930 1,786,867

UNITED STATES PATENT OFFICE

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LABEL PRINTING, FEEDING, AND CUTTING MACHINE

Application filed January 10, 1929. Serial No. 331,668.

The main objects of this invention are:

First, to provide a multiple label printing, feeding and cutting machine of large capacity.

Second, to provide an improved label feeding and cutting machine that will feed a plurality of flexible fabric label strips in taut condition to be printed and then deliver them to the cutting means which automatically and simultaneously cuts a plurality of labels from each of the strips.

Third, to provide an improved structure adapted and effective to operate a plurality of knives for severing a plurality of labels from a plurality of label strips.

Fourth, to provide a delivery means and conveyor to effectively throw out and discharge the labels from a plural cutting machine.

Objects pertaining to details and economies of construction and operation will definitely appear from the detailed description to follow.

A machine which embodies the features of my invention is illustrated in the accompanying drawing, in which:

Fig. 1 is a front elevation of my improved label feeding and cutting mechanism, an inverted die printing machine being shown in dotted lines.

Fig. 2 is a perspective view of the feed, cutter, throw out and discharge means, the main feed jaws being shown in the advanced position without the label strips therein, the projecting ends of the cut strips appearing in the main label strip holding or supporting jaws. This view is taken from a point above and to the right and in front of Fig. 1, the complete feed and cutter mechanism being shown.

Fig. 3 is an enlarged transverse detail sectional elevation on line 3—3 of Figs. 1, 4 and 7 with the label strip holder down in holding position.

Fig. 4 is an enlarged detail vertical longitudinal sectional elevation on line 4—4 of Figs. 3 and 5, the label strip holding jaws being shown in closed or gripping position and the label strips being fed forward and held in the feed jaws and holding jaws ready to be cut.

Fig. 5 is an enlarged detail sectional elevation view on line 5—5 of Figs. 1, 4 and 7 showing the cutting knife up and its relation to the actuating cam and the related jaws and one of the series of endless delivery conveyors.

Fig. 6 is a detail sectional elevation of the cam actuating means for the label feed means, the drive shaft in section on a line corresponding to line 6—6 of Fig. 3.

Fig. 7 is a detail longitudinal section view on line 7—7 of Figs. 3 and 5 showing the operating mechanism for the feed jaws.

Fig. 8 is an enlarged detail vertical longitudinal sectional elevation of the main feed jaws and the holding jaws shown in engagement with the label strip, the feed jaws having just picked up the free ends of the label strips ready for the feeding movement.

Fig. 9 is an enlarged detail sectional elevation view of the end feed jaw and trip cam means for opening and closing the same in open position at the out end of the stroke.

Fig. 10 is an enlarged detail outer end elevation view of the auxiliary feed jaws, the jaw cam actuating rockshaft being in section.

The parts will be identified by their numerals of reference which are the same in all the views.

1 is a printing machine of the inverted die and plate type. 2 is the inverted die actuated in the usual way. 3 is the counter. 4, 4 are a plurality of label strips. 5, 5 are a plurality of label strip supply reels. 6 is the guide for the label strips to the printing press. 7 is the frame for the feed and cutter mechanism having the longitudinal flange slide way 71 at one side and the parallel supporting flange 72 at the opposite side. This frame is adjustably supported on base 73.

8 is the driven cam shaft having a sprocket wheel 81 thereon and is driven by the chain 82. 9 is the reciprocating feed carriage carrying the feed jaws.

So that the details of this device may be the more readily understood, I will first describe it in a very general way. There are

main and auxiliary holding jaws and main and auxiliary feed jaws. On the frame 7 I provide the main pair of holding jaws 11 to hold the end of the label strips after the labels have been severed therefrom ready to be grasped by the feed jaws. The pair of auxiliary holding jaws 12 is in spaced relation from the main jaws 11 to hold a section at the ends of the label strips taut and in position for the return movement of the auxiliary feed jaws. These holding jaws are actuated by cams to open to permit the feeding of the strips and to close to grasp the label strips during the return movement of the feed jaws.

A series of shear cutters 13 are provided beyond the main holding jaws and under these cutters the strips of the label are fed preliminary to cutting the same by the plurality of shearing blades.

The feed jaws are carried by the reciprocating feed carriage 9 which travels in the ways 71 before referred to. 15 are the main feed jaws adapted to grasp the projecting ends of the label strips beyond the holding jaws 11 after they have been cut off and then feed the same under the knives for the next cutting operation. The jaws are shown in the advanced position in Fig. 4 with the knives raised. The engaging position of the main feed jaws to the ends of the label strips appears in Fig. 8.

16 are the auxiliary feed jaws which reciprocate in the area between the main holding jaws 11 and the auxiliary holding jaws 12. The feed jaws, in all instances, as well as the holding jaws, are opened and closed by suitable cams on the cam shaft. When the main jaws engage the end of the label strip as seen in Fig. 8, the auxiliary feed jaws 16 close into engagement with the label strips just in advance of the auxiliary supporting jaws 12. The holding jaws then open and the feed carriage advances carrying the feed jaws and the label strips to the next step for the next cutting operation. When the feed reaches the end of its stroke, the holding jaws again close, the knives cut off the labels from the strips and the feed jaws are then opened by a properly timed cam trip. An independent cam means is also provided for reciprocating the carriage feed so that the parts operate in definite timed relation to each other.

With this preliminary general description I will describe the various parts, their actuation and relations.

The main holding jaws 11 are supported on a pair of longitudinal supporting rods 17, 18 which serve also to support the stationary blades of the cutting shears, these being supported on end brackets 19, 20, see Fig. 3. The lower jaw member 111 has a longitudinal groove 112 into which depression the label strips are clamped. A series of guide loops 113 are carried by this lower jaw member 111 so that each label strip is separately guided in definite relation to the said holding jaws. 114 is the upper jaw member which is pivoted to arm 115 by pivot 116. The upper jaw member 114 is provided with a series of pins 114′ for separately engaging each label strip. Guard blade 114″ is disposed in front of the pins 114′. This member is provided with an upwardly projecting spring arm 117 to which is connected the tension compression spring 118, which holds the said upper swinging jaw 114 into contact with the lower jaw 111. An auxiliary guide loop 119 is secured to the side of this jaw and it, along with the jaw blade itself, is embraced in the slots of a guide 119′ secured to the frame 7. A cam actuated slide 21 has a projecting cam arm 210 with a cam surface 211 disposed, when reciprocated, to elevate the jaw member 114.

The auxiliary holding jaws comprise the main stationary jaw member 121 which is longitudinally grooved to form a depression for the engagement of the label strips. A movable jaw member 12 is provided with a rib 123 to coact with a depression in the stationary jaw 121. The upper jaw is hinged at 124 and is controlled by cam and trip lever means 125 which will be described in detail in connection with the auxiliary feed jaws which are actuated in the same way.

These jaws are held yieldingly in closed position by spring 126. A double stop 211 is carried by the cam actuated slide 21 and alternately actuates and trips the lever means 125 to open and close the said holding jaws. The relations of these parts clearly appear in Fig. 4.

The cam slide 21 is actuated by cam 22 carried on the cam shaft 8, see Fig. 4. Cam follower 212 is secured to the slide 21 and the slide is held under tension by tension spring 213, see Fig. 4. The slide 21 and its stops operate to open the main holding jaw and the auxiliary holding jaw at the same time and hold them open while the feed jaws are advancing the label strips and then tripping to close the same when the label strips have been fully advanced.

The feed jaws are secured to and carried by the reciprocating feed carriage 9. The main feed jaws 15 comprise a relatively fixed lower jaw member 151 having a slight depression towards its engaging end. Upper jaw member 152 is provided with spring fingers 153 which are downturned into engaging points, one for each label strip. The upper jaw is carried by pivoted arm 154 pivoted at 155 in cheek piece 156 and the jaw is held yieldingly downward by the compression spring 157. Cam 158, with flat end, having downwardly projecting actuating the trip lever 158″ is pivoted at 158′ to the cheek piece 156 and engages the project-

ing lug 159 on pivoted arm 154. The cam lever 158″ is actuated from the cam actuated slide 24. Stop 241 is at the outer end and is shown (see Figs. 7 and 9) actuating the cam lever 158″ to open the jaws as there illustrated to release the end labels after they have been severed from the strip. Stop 242 is shown in Fig. 7 in the position of tripping the cam lever 158″ to permit the compression spring 157 to close the jaws into engagement with the ends of the cut off label strips as detailed in Fig. 8.

The auxiliary feed jaws 16 comprise the comparatively fixed lower jaw 161 and the movable upper jaw 162 provided with a series of clamp spring fingers 163. The upper jaw is pivoted at 164 between the cheek pieces 165 and the jaws are opened by the cam 166 on the rockshaft 167 actuated by trip lever 168.

The cam actuated slide 24 is provided with stops 243 and 244 to act upon the trip lever 168 at each end of the travel. It is shown in the tripped position at the right of Fig. 7 with the label strips clamped. When the feed carriage moves to the left of that figure the cam lever 168 will contact with the stop 243 and open the jaws. The jaws will remain open until the feed carriage returns and the lever is again tripped to close the same.

The stop 243 is cut away as shown in Fig. 7 to permit the passage of the trip lever 158″ so that it will only be acted on by its appropriate stop. It will thus be seen that the lever 158″ and the lever 168 are tripped by stops on the cam actuated slide 24 and are operated simultaneously to grasp and feed the label stops. The slide 24 is actuated by cam 10 which reacts upon the cam follower arm 245 as seen in Fig. 7. The cam 10 is timed to cause the said feed jaws to open and close as described.

It will be seen that when the feed jaws have carried the label strips forward as indicated at the right of Fig. 4, the jaws are then opened at the time of severing the labels and the labels are then discharged. The feed carriage is then returned to the initial position and the jaws are closed to engage the ends of each of the label strips as detailed in Fig. 8.

The feed carriage 9 reciprocates in the ways 71 and is operated by a cam mechanism (see Figs. 2 and 6) which is precisely comparable to the mechanism shown for reciprocating the feed jaws in the companion application of George L. Bignell. I make no claim to the details of the mechanism but have used it in my combination. It comprises an actuating lever 91 fulcrumed on the frame and connected by link 92 to lug 93 on the feed carriage 9. Cam 94 on cam shaft 8 actuates rocking cam follower 95 which actuates the rocker 96 which is connected by adjustable pitman 97 to the said lever 91. The movement of the carriage can be adjusted to a nicety and be accurately controlled by the said cam so that it is timed for operation with the holding and feed jaws heretofore described. It is possible by the dwell of the cams to secure the timed operations as indicated, as will be clear from an inspection of the same.

13, 13, 13 are a plurality of cut off shears. Each comprises a lower blade member 131 and an upper pivoted blade member 132 which is pivoted on the pivot 133 and held yieldingly in cutting engagement by the compression spring 134. Each movable blade is provided with an actuating lever 135 having a cam follower wheel 136 and is held into engagement with the cam 271 hereafter described by the cam spring 137.

The upper blade 132 is ribbed at 132′ to wipe the severed label ends upward against the guard 114″ to insure their projection to be engaged by the main feed jaws. A longitudinal cam shaft 27 provided with cams 271 and driven by bevel gear 272 actuates the said upper shear members. These shears act upon the label strip which is held taut between the main feed jaws and the main holding jaws as seen in Fig. 4. The labels between the shears readily drop down. The labels at the end tend to remain in the feed jaws after the jaws have been opened. I therefore provide a stripper finger 28 carried on the rockshaft 281 actuated by lever 282 by cam 273 on shaft 27, see Fig. 2. Beyond each of the shears is disposed an endless conveyor 29 delivering the cut off labels, as they are severed, rapidly to one side into any suitable receptacle.

I have thus described my improved machine in detail. It will be observed that a plurality of label strips are delivered to the printing press and a group of labels printed on each strip. The label strips are then advanced into the machine and placed in the main holding jaws with their ends projecting. The machine is then operated, the main feeding jaws grasp the ends of the labels and advance them one step, thereby advancing the entire label strip a step. The cut off knives descend, cut off groups of labels, and the last group is stricken from the jaws by the stripper finger, the feed jaws having opened at that time.

The feed carriage then reciprocates, and the main jaws are brought to position to engage the cut off ends of the strips. The auxiliary jaws are also passed to the corresponding position on the label strip that is now held taut by the holding jaws. The feed jaws are then tripped by the cam means.

When the feeding jaws have thus engaged the label strips, the holding jaws are opened, the label strips are again advanced to the cut-

ting position, and the cycle of operation is completed.

I have shown a cam means in each instance especially adapted to the purpose but it is clear that a variety of means may be employed by suitable timed connections.

The use of a machine of this kind is of very great advantage. A single operation of the press in the particular arrangement here shown prints three labels on each of seven label strips, i. e., 21 labels in all. The strip is then advanced to the cutting position and the entire 21 labels are cut at a single stroke. Every stroke of the machine thereafter results in the production of 21 complete labels. The rapidity of action over any hand method is apparent.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a label printing, feeding, and cutting machine, the combination of a printing press, a plurality of label strip feed reels, a guide for the label strips to the press, a feed and cutting means comprising a frame with a main holding jaw, an auxiliary holding jaw in spaced relation therefrom to embrace and hold said plurality of label strips under tension, a cam trip means for opening and closing the holding jaws comprising a slide with actuating stops, a cam for actuating said slide to open and close the holding jaws independent of the motions of the feed mechanism, a reciprocating feed carriage, a main feed jaw for engaging the ends of label strips disposed on said carriage and adapted to engage the ends of the label strips, an auxiliary feed jaw disposed in spaced relation to said main feed jaws and adapted to reciprocate and act between the said holding jaws, cam actuating means for simultaneously actuating the said jaws and tripping the same to close comprising a slide with stops for actuating and tripping the said jaws, a cam for actuating said slide timed to close said jaws during the feeding operation and open the same on return movement, a plurality of parallel cut off shears one of which is disposed in proximity to the main holding jaws and provided with a wiping rib to wipe the ends of the strips upwardly into projecting position, cam means for actuating said shears timed to act simultaneously and shear the tensioned strips between the main holding and main feed jaws, a tripper finger to discharge severed labels from the main feed jaws, a cam to actuate the same, endless belt delivery means adjacent each shear to receive the cut off labels and discharge the same, and cam means for reciprocating the feed carriage with the feed jaws timed to cooperate with said holding jaws, as specified.

2. In a label printing, feeding and cutting machine, the combination of a printing press, a plurality of label strip feed reels, a guide for the label strips to the press, a feed and cutting means comprising a frame with a main holding jaw, an auxiliary holding jaw in spaced relation therefrom to embrace and hold said plurality of label strips under tension, a cam trip means for opening and closing the holding jaws comprising a slide with actuating stops, a cam for actuating said slide to open and close the holding jaws independent of the motions of the feed mechanism, a reciprocating feed carriage, a main feed jaw for engaging the ends of label strips disposed on said carriage and adapted to engage the ends of the label strips, an auxiliary feed jaw disposed in spaced relation to said main feed jaws and adapted to reciprocate and act between the said holding jaws, cam actuating means for simultaneously actuating the said jaws and tripping the same to close comprising a slide with stops for actuating and tripping the said jaws, a cam for actuating said slide timed to close said jaws during the feeding operation and open the same on return movement, a plurality of parallel cut off shears one of which is disposed in proximity to the main holding jaws and provided with a wiping rib to wipe the ends of the strips upwardly into projecting position, cam means for actuating said shears timed to act simultaneously and shear the tensioned strips between the main holding and main feed jaws, means to discharge the severed labels, and cam means for reciprocating the feed carriage with the feed jaws timed to cooperate with said holding jaws, as specified.

3. In a label printing, feeding and cutting machine, the combination of a printing press, a plurality of label strip feed reels, a guide for the label strips to the press, a feed and cutting means comprising a frame with a main holding jaw, an auxiliary holding jaw in spaced relation therefrom to embrace and hold said plurality of label strips under tension, a cam trip means for opening and closing the holding jaws comprising a slide with actuating stops, a cam for actuating said slide to open and close the holding jaws independent of the motions of the feed mechanism, a reciprocating feed carriage, a main feed jaw for engaging the ends of label strips disposed on said carriage and adapted to engage the ends of the label strips, an auxiliary feed jaw disposed in spaced relation to said main feed jaws and adapted to reciprocate and act between the said holding jaws, cam actuating means for simultaneously actuating the said jaws and tripping the same to close comprising a slide with stops for actuating and tripping the said jaws, a cam for actuating said slide timed to close said jaws during the feeding operation and open the same on return movement, a plurality of parallel cut off shears one of which is disposed in proximity to

the main holding jaws, cam means for actuating said shears timed to act simultaneously and shear the tensioned strips between the main holding and main feed jaws, means to discharge the severed labels, and cam means for reciprocating the feed carriage with the feed jaws timed to cooperate with said holding jaws, as specified.

4. In a label printing, feeding and cutting machine, the combination of a printing press, a plurality of label strip feed reels, a guide for the label strips to the press, a feed and cutting means comprising a frame with a main holding jaw, a cam trip means for opening and closing the holding jaw comprising a slide with actuating stops, a cam for actuating said slide to open and close the holding jaw independent of the motions of the feed mechanism, a reciprocating feed carriage, a main feed jaw for engaging the ends of label strips disposed on said carriage and adapted to engage the ends of the label strips, an auxiliary feed jaw disposed in spaced relation to said main feed jaws and adapted to reciprocate and act back of said holding jaw, cam actuating means for simultaneously actuating the said jaws and tripping the same to close comprising a slide with stops for actuating and tripping the said jaws, a cam for actuating said slide timed to close said jaws during the feeding operation and open the same on return movement, a plurality of parallel cut off shears one of which is disposed in proximity to the main holding jaws, cam means for actuating said shears timed to act simultaneously and shear the tensioned strips between the main holding and main feed jaws, means to discharge the severed labels, and cam means for reciprocating the feed carriage with the feed jaws timed to cooperate with said holding jaws, as specified.

5. In a label printing, feeding and cutting machine, the combination of a printing press, a plurality of label strip reels, a guide for the label strips to the press, a feed and cutting means comprising a frame with a main holding jaw, an auxiliary holding jaw in spaced relation therefrom to embrace and hold said plurality of label strips under tension, a cam trip means for opening and closing the holding jaws comprising a slide with actuating stops, a cam for actuating said slide to open and close the holding jaws independent of the motions of the feed mechanism, a reciprocating feed carriage, a main feed jaw for engaging the ends of label strips disposed on said carriage and adapted to engage the ends of the label strips, cam actuating means for actuating the said jaws and tripping the same timed to close said jaws during the feeding operation and open the same on return movement, a plurality of parallel cut off shears one of which is disposed in proximity to the main holding jaws, cam means for actuating said shears timed to act simultaneously and shear the tensioned strips between the main holding and main feed jaws, means to discharge the severed labels, and cam means for reciprocating the feed carriage with the feed jaws timed to cooperate with said holding jaws, as specified.

6. In a label printing, feeding and cutting machine, the combination of a printing press, a plurality of label strip feed reels, a guide for the label strips to the press, a feed and cutting means comprising a frame with a main holding jaw, a cam trip means for opening and closing the holding jaw comprising a slide with actuating stops, a cam for actuating said slide to open and close the holding jaw independent of the motions of the feed mechanism, a reciprocating feed carriage, a main feed jaw for engaging the ends of label strips disposed on said carriage and adapted to engage the ends of the label strips, cam actuating means for actuating the said jaws and tripping the same timed to close said jaws during the feeding operation and open the same on return movement, a plurality of parallel cut off shears one of which is disposed in proximity to the holding jaw, cam means for actuating said shears timed to act simultaneously and shear the tensioned strips between the holding and feed jaws, means to discharge the severed labels, and cam means for reciprocating the feed carriage with the feed jaws timed to cooperate with said holding jaws, as specified.

7. In a label printing, feeding and cutting machine, the combination of a printing press, a plurality of label strip feed reels, a guide for the label strips to the press, a feed and cutting means comprising a frame with a main holding jaw, an auxiliary holding jaw in spaced relation therefrom to embrace and hold said plurality of label strips under tension, a cam trip means for opening and closing the holding jaws comprising a slide with actuating stops, a cam for actuating said slide to open and close the holding jaws independent of the motions of the feed mechanism, a reciprocating feed carriage, a main feed jaw for engaging the ends of label strips disposed on said carriage and adapted to engage the ends of the label strips, an auxiliary feed jaw disposed in spaced relation to said main feed jaws and adapted to reciprocate and act between the said holding jaws, cam actuating means for simultaneously actuating the said jaws and tripping the same to close comprising a slide with stops for actuating and tripping the said jaws, a cam for actuating said slide timed to close said jaws during the feeding operation and open the same on return movement, cut off shears disposed in proximity to the main holding jaws, cam means for actuating said shears timed to act simultaneously and shear the tensioned strips

between the main holding and main feed jaws, a tripper finger to discharge severed labels from the main feed jaws, a cam to actuate the same, endless belt delivery means adjacent each shear to receive the cut off labels and discharge the same, and cam means for reciprocating the feed carriage with the feed jaws timed to cooperate with said holding jaws, as specified.

8. In a label printing, feeding and cutting machine, the combination of a printing press, a label strip feed reel, a feed and cutting means comprising a frame with a main holding jaw, an auxiliary holding jaw in spaced relation therefrom to embrace and hold said label strip under tension, a cam trip means for opening and closing the holding jaw comprising a slide with actuating stops, a cam for actuating said slide to open and close the holding jaw independent of the motions of the feed mechanism, a reciprocating feed carriage, a main feed jaw for engaging the ends of the label strip disposed on said carriage and adapted to engage the end of the label strip, an auxiliary feed jaw disposed in spaced relation to said main feed jaws and adapted to reciprocate and act between the said holding jaws, cam actuating means for simultaneously actuating the said jaws and tripping the same to close comprising a slide with stops for actuating and tripping the said jaws, a cam for actuating said slide timed to close said jaws during the feeding operation and open the same on return movement, a plurality of parallel cut off shears one of which is disposed in proximity to the main holding jaws, cam means for actuating said shears timed to act simultaneously and shear the tensioned strips between the main holding and main feed jaws, and cam means for reciprocating the feed carriage with the feed jaws timed to cooperate with said holding jaws, as specified.

In witness whereof I have hereunto set my hand.

ARTHUR ROSENTHAL.