July 17, 1934. G. A. PIEPENBRING ET AL 1,966,903

LABEL CUTTING AND FOLDING MACHINE

Original Filed July 19, 1930 3 Sheets-Sheet 1

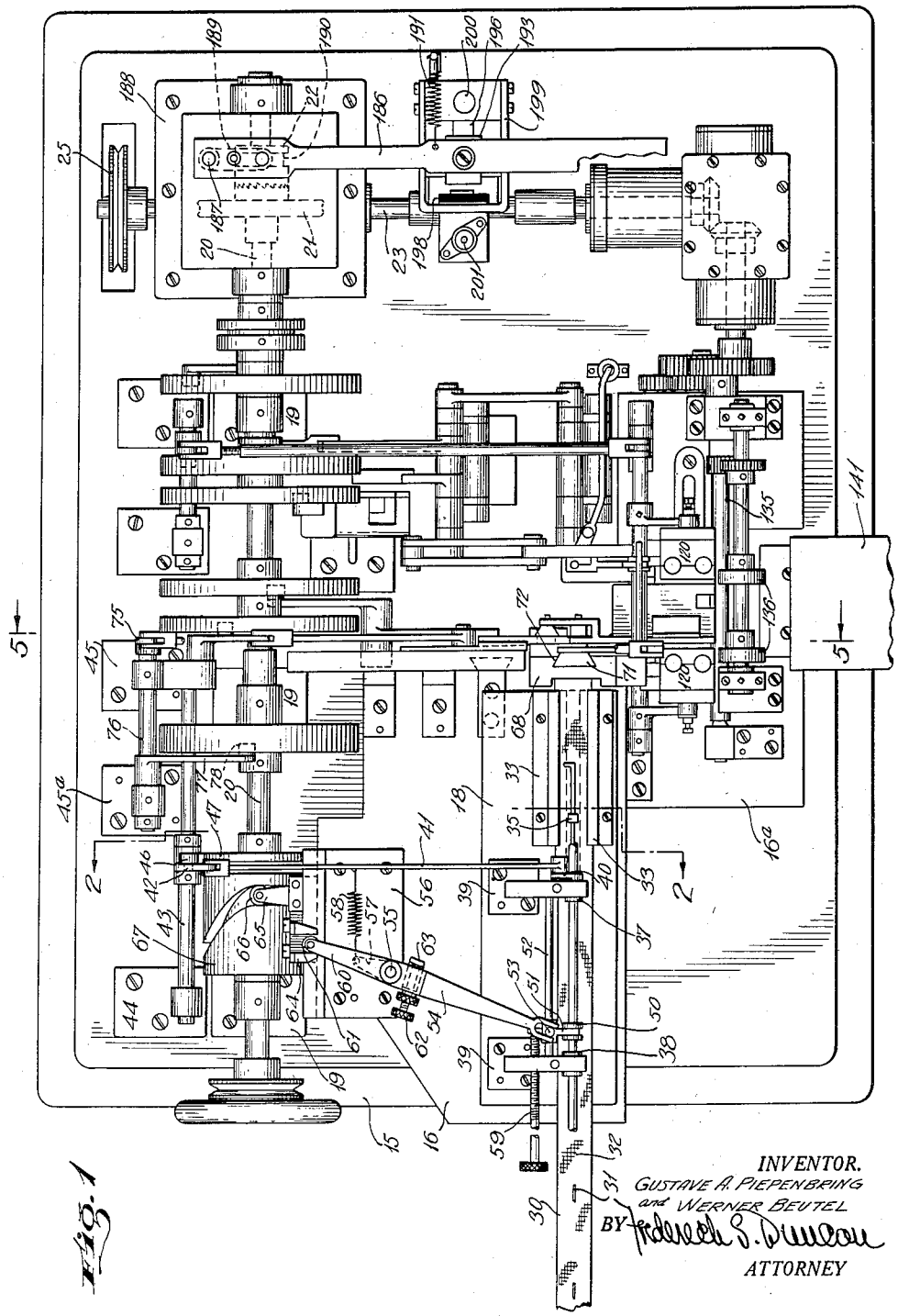


Fig. 1

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Original Filed July 19, 1930 3 Sheets-Sheet 2

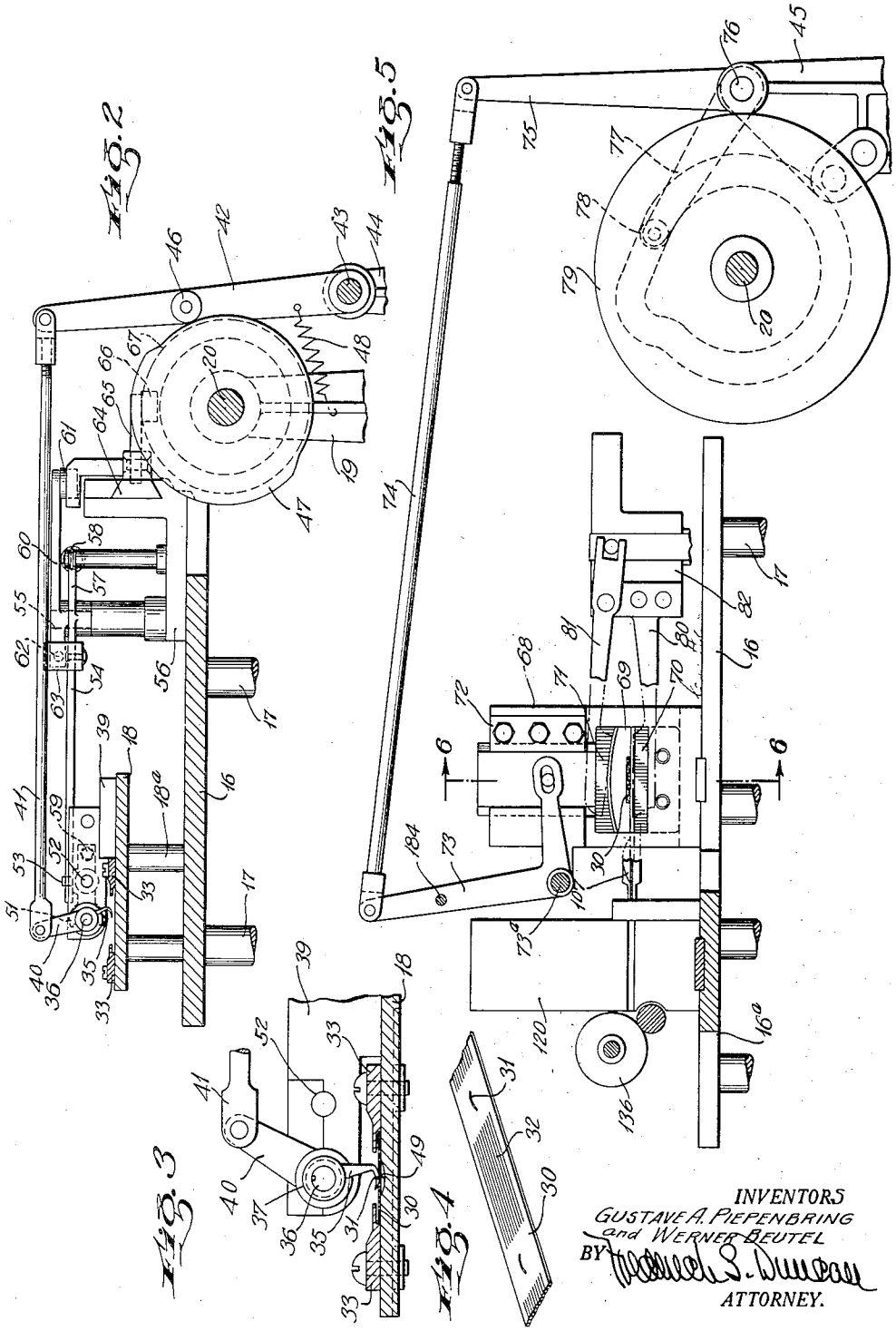


Fig. 2

Fig. 5

Fig. 3

Fig. 4

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Fig. 6

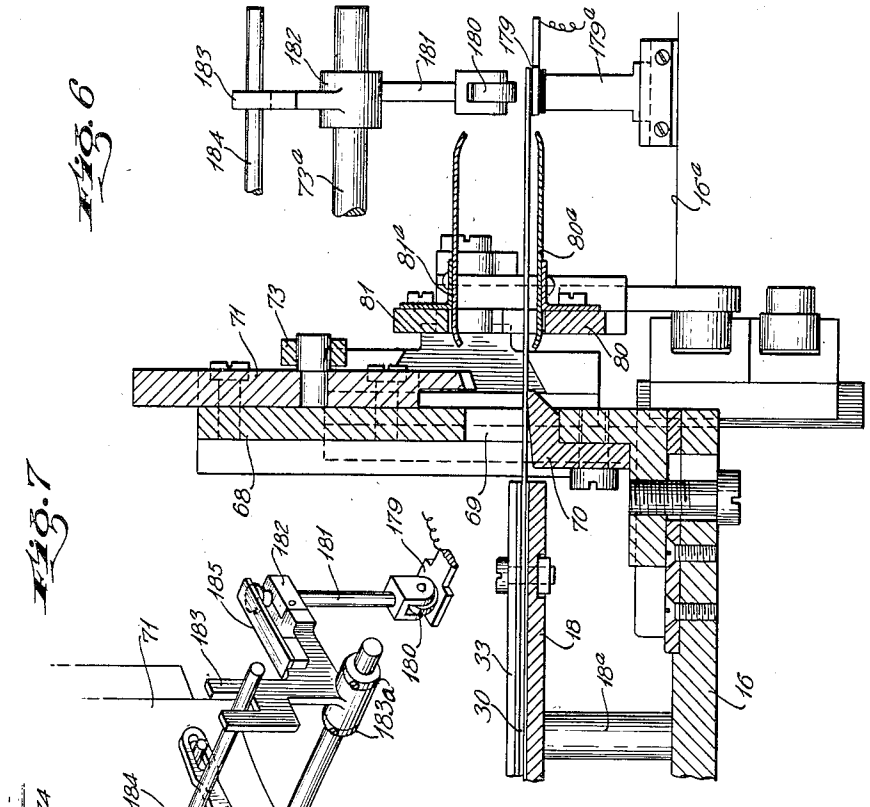
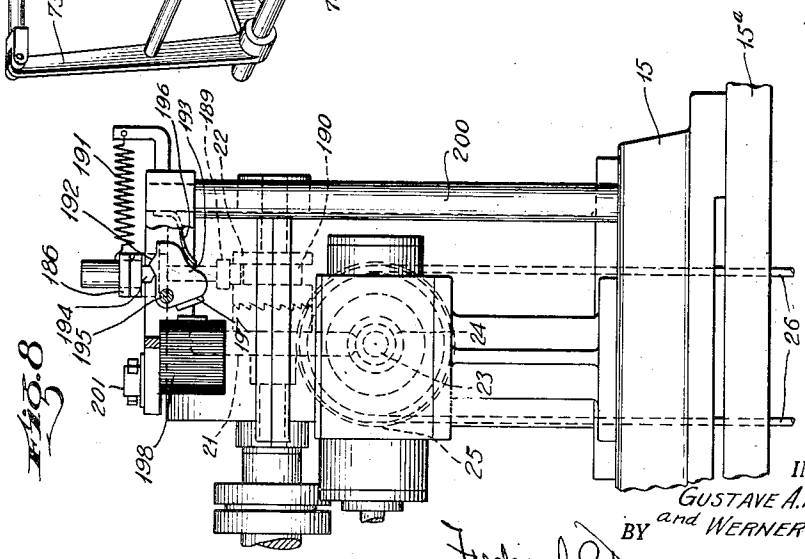



Fig. 7




Fig. 8




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# UNITED STATES PATENT OFFICE

1,966,903

## LABEL CUTTING AND FOLDING MACHINE

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Original application July 19, 1930, Serial No. 469,016. Divided and this application May 25, 1932, Serial No. 613,408

12 Claims. (Cl. 164—48)

The present invention is a division of our co-pending application Serial No. 469,016, filed July 19, 1930.

Our invention relates to label cutting and folding machines and has for an object to provide means for cutting labels from a continuous strip, and folding over the cut edges of each label.

Our machine is particularly adapted for use in handling a continuous strip of fabric in which the label markings are woven or otherwise formed. One of the problems in operating on continuous label strips is that of feeding the strip in such manner that the severing of the strip will always take place midway between label markings. We prefer to use label strips of the type in which a floating thread or loop is provided between each label marking and the next adjacent marking and it is an object of our invention to provide improved feeding means which will pick up a floating thread and thereby feed the strip to the severing mechanism.

A further object is to provide feeding means which will disengage the floating thread after feeding the strip a label's length and return to pick up the next subsequent floating thread.

Another object is to provide means for adjusting the stroke of the feeding means to adapt the machine for labels of different length.

Another object of the invention is to provide improved severing means which will not impart a lateral thrust to the label strip.

Another object is to provide means for stopping the operation of the machine when the label strip is exhausted or whenever for any reason there is an interruption in the feed of labels to folding position.

Other objects and advantages of our invention will appear in the following description of a preferred embodiment and thereafter the novelty and scope of our invention will be pointed out in the claims.

In the accompanying drawings:

Figure 1 is a plan view of our improved label cutting and folding machine;

Fig. 2 is a fragmental view in section taken on the line 2—2 of Fig. 1;

Fig. 3 is an enlargement of a portion of Fig. 2 showing certain parts in a different position;

Fig. 4 is a fragmental view of a label strip showing floating threads or loops thereon;

Fig. 5 is a fragmental view in section taken on the line 5—5 of Fig. 1, and showing the mechanism for cutting the labels;

Fig. 6 is an enlarged view in section of the label cutting means, the section being taken on the line 6—6 of Fig. 5;

Fig. 7 is a view in perspective of an automatic contact device for stopping certain parts of the machine when there is an interruption in the feed of the label strip; and

Fig. 8 is a fragmental view in front elevation of the right hand end of the machine, showing certain clutch mechanism.

Our machine comprises a base plate 15 adapted to be supported on a bench 15*a*. Mounted on the base plate 15 is a table comprising a plate 16 supported on vertical posts 17. Above this table there is an upper table comprising a plate 18 supported on short posts 18*a* rising from the plate 16. The plate 16 extends from the left hand end of the machine, as viewed in Figure 1, to a point close to the middle of the machine, and there is an offset extension 16*a* of this plate which runs across the middle and fore part of the machine.

Rising from the rear portion of the base plate 15 are brackets 19 which provide bearings for a cam shaft 20. A worm wheel 21 is journaled on the shaft 20 at the right hand end thereof, as viewed in Fig. 8. On the hub of the worm wheel are clutch teeth adapted to mesh with the teeth of a clutch member 22 which is splined on the shaft 20. A means which will be described hereinafter, operates to hold the clutch member 22 normally in engagement with the teeth on the hub of the worm wheel 21 so that the worm wheel will turn the shaft 20. Below the shaft 20 and running at right angles thereto is a main drive shaft 23 provided with a worm 24 which meshes with the worm wheel 21 and by which the cam shaft is driven when the clutch is in normal engaging position. The main shaft 23 is provided with a pulley 25 at one end which is driven by means of belt 26 connected to any suitable source of power.

The tape 30 which is to be cut and folded in this machine is introduced into the machine from the left hand side, as viewed in Fig. 1, and is supported on the plate 18. As shown particularly in Fig. 4 the tape is provided with floating threads or loops 31 located between the label markings 32 formed on the tape. These floating threads provide means for advancing the tape to a severing mechanism. The tape is guided on the plate 18 between a pair of guide rails 33 which are clearly shown in Fig. 3. A finger 35 is adapted to pick up a loop 31 and then to advance the tape toward the severing mechanism through a distance equal to the spacing between successive loops.

The finger 35 is mounted on the end of a shaft 36 which is slidable in bearing sleeves 37 and 38 journaled in brackets 39 secured to the plate 18. A feather in the sleeve 37 engages a key way in the shaft 36 so that rotation of the sleeve 37 will cause rotation of the shaft 36. The sleeve 37 is provided with a crank arm 40, the outer end of which is connected by a link 41 to an arm 42 fixed on a shaft 43. The latter is journaled in suitable brackets 44 and 45 supported by the base plate 15. The arm 42 carries a roller 46 which bears against the periphery of a cam wheel 47 fixed upon the shaft 20. A spring 48, acting on the arm 42, serves to press the roller 46 against the cam, so that as the latter rotates, the finger 35 is oscillated to engage or disengage the loop 31. To provide clearance for the finger 35 as it wipes transversely across the tape 30, a recess 49 (Fig. 3) is formed in the plate 18 under the line of travel of the tape 30.

Fixed on the shaft 36 is a collar 50 (Fig. 1) provided with an annular groove to receive the forked arms of a slide block 51. This slide block is adapted to slide on a rod 52 supported in the brackets 39. A pin 53 rising from the slide block 51 is engaged by the forked end of a lever arm 54. The lever is fulcrumed at 55 on a pin projecting from a bracket 56 supported on the plate 16 and has a rearwardly projecting arm 57 which is normally pulled by a spring 58, so as to hold the slide block 51 against an adjustable stop 59 carried by the left hand bracket 39. Also swiveled on the pin 55 is another lever having a rearwardly projecting arm 60 which carries a roller 61. A forwardly projecting arm of this lever carries an adjustable thumb screw 62 which is adapted to engage a lug 63 rising from the arm 54. The roller 61 is embraced between a pair of arms carried by a slide block 64 arranged to slide in suitable ways in the bracket 56. An arm 65 rigidly attached to the slide block 64 carries a roller 66 adapted to engage a groove in a drum cam 67 fixed upon the shaft 20.

The operation of the label feeding mechanism will now be understood. The shaft 36 being in retracted position with the slide block 51 bearing against the stop 59 and the finger 35 being in the retracted position shown in Fig. 2, the cam 47 operates to oscillate said finger, causing it to scrape across the surface of the tape 30 and engage one of the loops 31, as shown in Fig. 3. The cam 47 then holds the finger in engaging position, while the cam 67 slides the shaft 36 toward the right, advancing the tape 30. After the label has been advanced the requisite distance, the cam 47 operates to withdraw the finger and the cam 67 then returns the finger to its original position where it will be ready to pick up the next loop 31.

The pick-up finger 35, as shown in Fig. 1, is extended in the direction of the longitudinal axis of the tape so that when advanced it will carry the loop all the way to the severing mechanism and the finger must be withdrawn from the loop before the severing operation takes place. Obviously, the loops need not be centered between the label markings, but may be located to the rear of such central position, so that the finger need not be withdrawn from the loop prior to the severing operation. In cases where the spacing of the label lengths is fairly uniform, a pick-up may be employed which has no longitudinal extension and which will carry the loop to a point which is a label's length away from the severing mechanism. In such cases, it is not necessary to disengage the finger from the loop before the tape is severed. The tape is ordinarily stiff enough so that the part in advance of the finger will be guided without wrinkling or distortion by the guides 33.

The point at which the finger 35 picks up a loop may be adjusted by means of the stop screw 59, and the stroke of the shaft 36 may be adjusted very accurately for labels of different lengths by means of the thumb screw 62. Thus the label strip will be advanced a label's length at each rotation of the cam shaft, the label's length being determined by the spacing of the loops 31. Slight variations of spacing, due to irregularities of weave, will not have a cumulative effect, because the extent of feed of the strip at each stroke of the machine is gaged by the loops woven into the strip.

The severing mechanism is clearly shown in Figs. 5 and 6. Mounted on the plate 16 is a bracket 68 which has an opening 69 therein through which the tape 30 passes. Projecting into this opening is a lower-fixed shear blade 70 which cooperates with an upper vertically-movable blade 71 to sever the tape 30. The blade 71 is formed with an arched cutting edge so that there will be no lateral thrust on the tape as it is being severed, but instead there will be a shearing action running from each edge of the tape toward the middle. The blade 71 slides in vertical ways 72 formed in the bracket 68 and is raised and lowered in timed relation to the operation of the label feeding mechanism. One arm of a bell-crank 73 fixed on a shaft 73*a* journaled in the bracket 68, has pin-and-slot connection with the blade 71, while the other arm is connected by a link 74 to an arm 75 fixed on a shaft 76. The latter is journaled in brackets 45 and 45*a* carried by the base plate. An arm 77 fixed on the shaft 76 carries a roller 78 which engages a groove in a cam 79 fixed on the cam shaft 20. Hence, as the cam 79 rotates with the cam shaft the blade 71 will be raised and lowered by engagement of the roller 78 with the groove in said cam. In the particular embodiment of our invention illustrated in the drawings, the parts are so related that the tape projecting between the shear blades will be severed through a loop 31 immediately after the finger 35 has been withdrawn therefrom.

The portion of the tape which projects through the opening enters between a pair of fingers 80 and 81 which have laterally projecting resilient flanges or plates 80*a* and 81*a* respectively, adapted to provide broad bearing surfaces, as shown in Fig. 6. By means of suitable mechanism driven from the shaft 20, the finger 81 closes down upon the finger 80 so that the projecting end of the tape is gripped between the resilient plates 80*a* and 81*a* before the cutter blade 71 descends. After the label has been severed the fingers advance toward the left, as shown in Fig. 5, so that suitable folding means 107 will fold over the ends of the label as it is being advanced toward a pair of pressing units 120. These units are then operated to press the folded edges of the label and the fingers are withdrawn to receive the next label. From the pressing units the label is fed by rollers 135 and 136 into a hopper 141. The mechanism for operating said fingers, pressing units, and rollers is fully described in the parent application of which the present application is a division and consequently needs no detailed description here.

A safety device is provided for stopping the rotation of the cam shaft in case of any failure in

the feed of tape to the severing mechanism, or when the supply of tape is exhausted. The safety mechanism is illustrated particularly in Figs. 6 and 7. As the label strip is fed through the severing mechanism and between the finger plates 80*a* and 81*a*, the forward end of the strip is projected over a contact plate 179 supported on a post 179*a* rising from the plate 16*a*. The plate 179 is electrically insulated from said post. A caster 180 is adapted to engage this plate and the stem 181 of the caster is carried by an arm 182. The latter is pivoted on the shaft 73*a* which carries the bell-crank that operates the cutter plate 71. Rising from the arm 182 is a bifurcated arm 183 which embraces a rod 184 fixed to the bell crank lever 73, so that as said bell crank lever is operated to raise and lower the cutting blade 71, the arm 182 and the caster 180 are also raised and lowered. The stem 181 has limited sliding movement in the arm 182, but is normally pressed downward by a contact spring 185 carried by the arm 182 so as to provide a yielding contact of the caster with the plate 179.

The operation of the device is as follows: When the feeding mechanism is operating properly, the tape is projected across the plate 179, while the cutter blade 71 and the caster 180 are in raised position. Then, as the cutter blade moves downward, the caster roller is electrically insulated from the plate 179 by the intervening tape. If there should be no tape on the plate 179, when the caster comes down, the plate 179 will be grounded to the caster thereby energizing a magnet 198 which throws out the clutch connecting the cam shaft 20 and worm wheel 21, and stopping the cam shaft.

The clutch operating mechanism comprises a clutch lever 186 (Figs. 1 and 8) fixed on the outer end of a vertical shaft 187 journaled in a gear box 188 enclosing the clutch members and gearing connecting shafts 20 and 23. Secured to the lower end of the shaft 187 is a crank arm 189 which bears a roller engaging an annular groove 190 formed in the clutch member 22. A spring 191 acting on the lever 186 tends to pull the lever toward the right as viewed in Fig. 8, withdrawing the clutch member 22 from engagement with the hub of the worm gear 21. The clutch, however, is held in engaging position by a boss 192 formed on a latch 193 which engages a lug 194 projecting from the under surface of the lever 186. This latch is pivoted on a pin 195 fixed in a frame 199 supported on a post 200 and is normally held in raised position by a spring 196. The boss 192 and the end of the lug 193 are V-shaped so that the latter may be snapped past the boss in either direction when sufficient lateral pressure is applied to the lever 186. The latch 193 is provided with an extension 197 which serves as an armature for the magnet 198. One terminal of this magnet is grounded and the other is connected through a source of electrical energy and to the contact plate 179, so that whenever the latter is grounded by contact with caster 180 the circuit of the magnet is closed. When the magnet 198 is energized, it withdraws the latch 192 from engagement with the lug 194 and permits the spring 191 to disengage the clutch. The operator of the machine may reengage the clutch merely by swinging the lever 186 back to normal position, so that the lug 194 snaps over the boss 192. A button switch 201 in the circuit of the magnet may be depressed to energize the magnet whenever the operator wishes to stop the cam shaft.

Provision is made for adjusting the machine to handle labels of different length. For this reason, the bracket which carries the folder on the right hand side of the machine, as viewed from the front, is adjustable in ways, as is also the post 179*a* which carries the contact plate 179. The arm 183 is adjustable along the shaft 73*a*, being fixed between collars 183*a* secured by set screws to said shaft.

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

We claim:

1. In a machine for cutting labels from a continuous run of tape, said tape being formed with thread loops, a feed finger, means for oscillating the finger transversely to the tape to engage and disengage one of said loops, a cutter, means for advancing the finger while in engagement with the loop to feed the tape to severing position with respect to the cutter, and means for operating the cutter in timed relation to the tape feeding means to sever the tape.

2. In a machine for cutting labels from a continuous run of tape, said tape being formed with thread loops, a feed finger, means for oscillating the finger transversely to the tape to engage and disengage one of said loops, a cutter, means for advancing the finger while in engagement with the loop to feed the tape to severing position with respect to the cutter, means for returning the finger while disengaged from the loop, and means for operating the cutter in timed relation to the tape feeding means to sever the tape.

3. In a machine for cutting labels from a continuous run of tape, said tape being formed with thread loops, a feed finger, means for oscillating the finger transversely to the tape to engage and disengage one of said loops, a cutter, means for advancing the finger while in engagement with the loop to feed the tape to severing position with respect to the cutter, means for returning the finger while disengaged from the loop, means for varying the length of advance of the finger, and means for operating the cutter in timed relation to the tape feeding means to sever the tape.

4. In a machine for cutting labels from a continuous run of tape, said tape being formed with thread loops, a cutter, a feed finger, means for oscillating the finger to enter and withdraw from one of said loops, means for advancing the finger while entered into the loop to feed the tape to the cutter, and means for operating the cutter to sever the tape while the finger is withdrawn from the loop.

5. In a machine for cutting labels from a continuous run of tape, said tape being formed with thread loops, a cutter, a feed finger, means for moving the finger transversely to the tape in one direction to engage and in another to disengage one of said loops, means for reciprocating the finger lengthwise of the tape in timed relation to the transverse movement of the finger whereby one stroke of the reciprocating movement will take place while the finger is in engagement with the loop to feed the tape to the cutter and the return stroke while the finger is disengaged from the loop, and means for actuating the cutter after each forward stroke of the finger.

6. In a machine for cutting labels from a continuous run of tape, said tape being formed with thread loops, a cutter, a feed finger, means for moving the finger transversely to the tape in one direction to engage and in another to disengage one of said loops, means for reciprocating the

finger lengthwise of the tape in timed relation to the transverse movement of the finger whereby one stroke of the reciprocating movement will take place while the finger is in engagement with the loop to feed the tape to the cutter and the return stroke while the finger is disengaged from the loop, and means for actuating the cutter while the finger is disengaged from the loop.

7. In a machine for cutting labels from a continuous run of tape, said tape being formed with thread loops, a cutter, a feed finger, means for moving the finger transversely to the tape in one direction to engage and in another to disengage one of said loops, means for reciprocating the finger lengthwise of the tape in timed relation to the transverse movement of the finger whereby one stroke of the reciprocating movement will take place while the finger is in engagement with the loop to feed the tape to the cutter and the return stroke while the finger is disengaged from the loop, and means for varying the length of the stroke of the finger.

8. In a machine for cutting labels from a continuous run of tape, said tape being formed with thread loops, a cutter, a feed finger, means for moving the finger transversely to the tape in one direction to engage and in another to disengage one of said loops, means for reciprocating the finger lengthwise of the tape in timed relation to the transverse movement of the finger whereby one stroke of the reciprocating movement will take place while the finger is in engagement with the loop to feed the tape to the cutter and the return stroke while the finger is disengaged from the loop, and means for shifting the stroke of the finger with respect to the cutter.

9. In a machine for cutting labels from a continuous run of tape, said tape being formed with thread loops, a cutter, a feed finger, means for moving the finger transversely to the tape in one direction to engage and in another to disengage one of said loops, means for advancing the finger while in engagement with the loop to feed the tape to the cutter, means for operating the cutter to sever the tape while the finger is disengaged, means for returning the finger while the finger is disengaged from the loop, and means for adjusting the position of the finger with respect to the advancing means to vary the length of stroke of the finger.

10. In a machine for cutting labels from a tape, a cutter, means for feeding tape to the cutter, means for operating the cutter to cut off a label, a clutch controlling the operation of both of said means, electrically controlled means for disengaging said clutch, the circuit of the clutch-disengaging means including a normally open switch, and means tending to close said switch at each operation of the cutter, the switch being so located that the label to be cut off is interposed therein to prevent closing of said circuit.

11. In a machine for cutting labels from a tape, a cutter, means for feeding tape to the cutter, means for operating the cutter to cut off a label, a clutch controlling the operation of both of said means, electrically controlled means for disengaging said clutch, the circuit of the clutch disengaging means including a normally open switch, means tending to close said switch at each operation of the cutter, the switch being so located that the label to be cut off is interposed therein to prevent closing of said circuit, and a manually-operable means for energizing the clutch disengaging means.

12. In a machine for cutting labels from a continuous run of tape, said tape being formed with thread loops, a cutter, a feed finger, means for moving the finger transversely to the tape in one direction to engage and in another to disengage one of said loops, means for reciprocating the finger lengthwise of the tape in timed relation to the transverse movement of the finger whereby one stroke of the reciprocating movement will take place while the finger is in engagement with the loop to feed the tape to the cutter, and a return stroke while the finger is disengaged from the loop, means for actuating the cutter after each forward stroke of the finger, means for varying the length of stroke of the finger, and means for shifting the stroke of the finger with respect to the cutter.

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