Feb. 10, 1942. J. A. HECKMAN 2,272,408

SHEET FEEDING AND CUTTING MECHANISM

Filed Dec. 6, 1940 3 Sheets-Sheet 1

Fig. 1

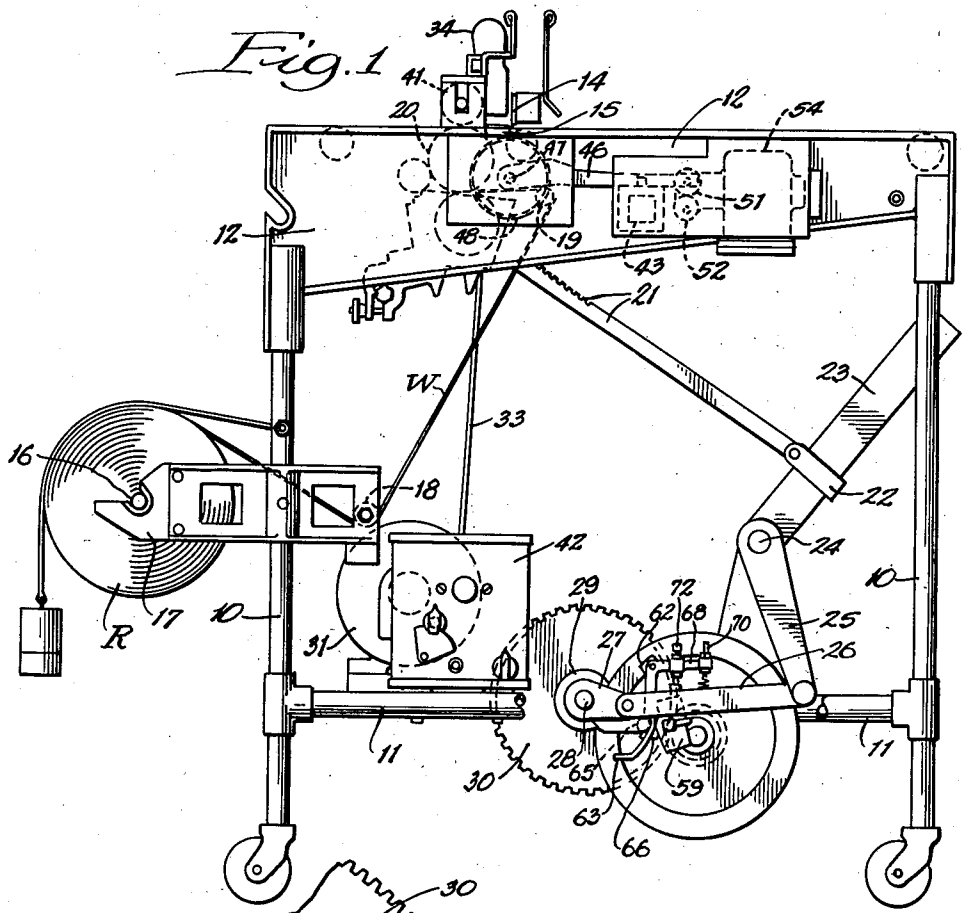
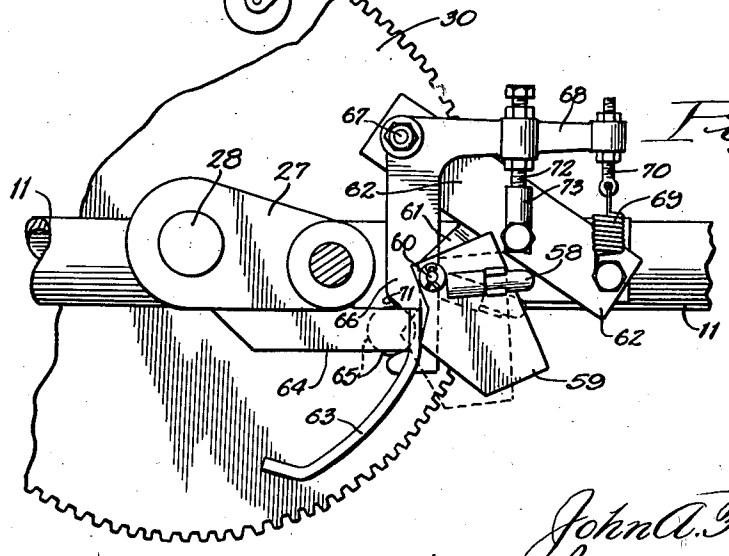


Fig. 2



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SHEET FEEDING AND CUTTING MECHANISM

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Fig. 3

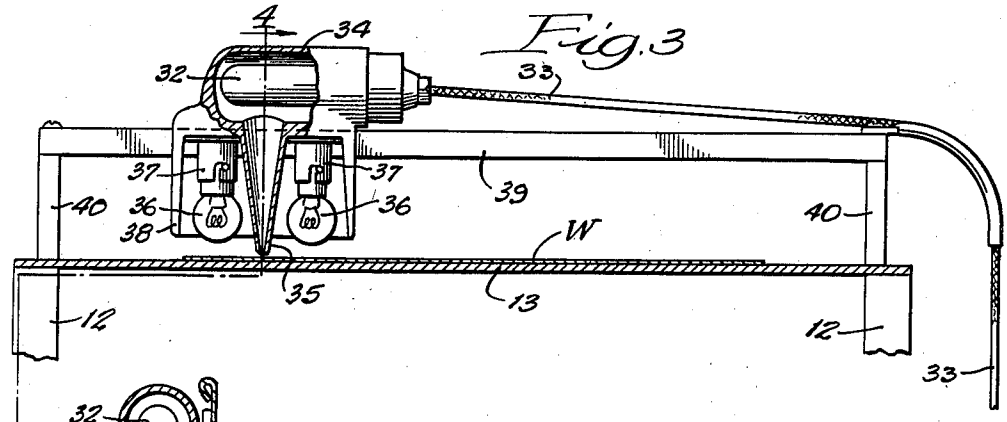


Fig. 4

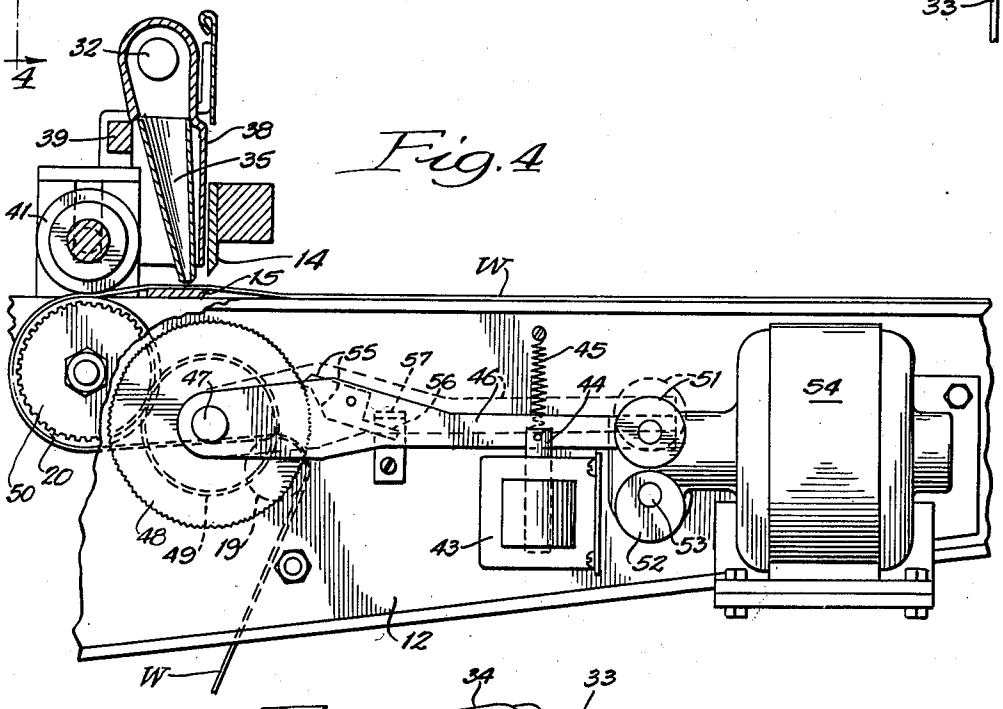
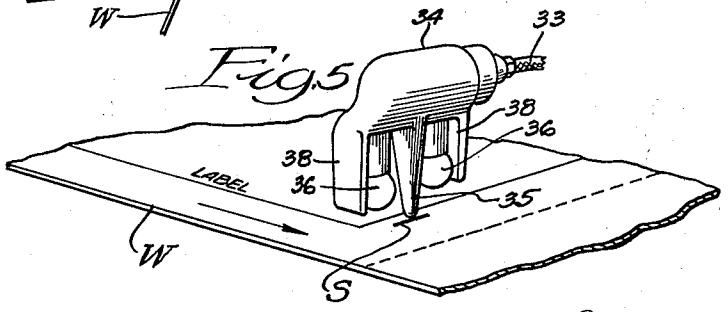


Fig. 5



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SHEET FEEDING AND CUTTING MECHANISM

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Fig. 6

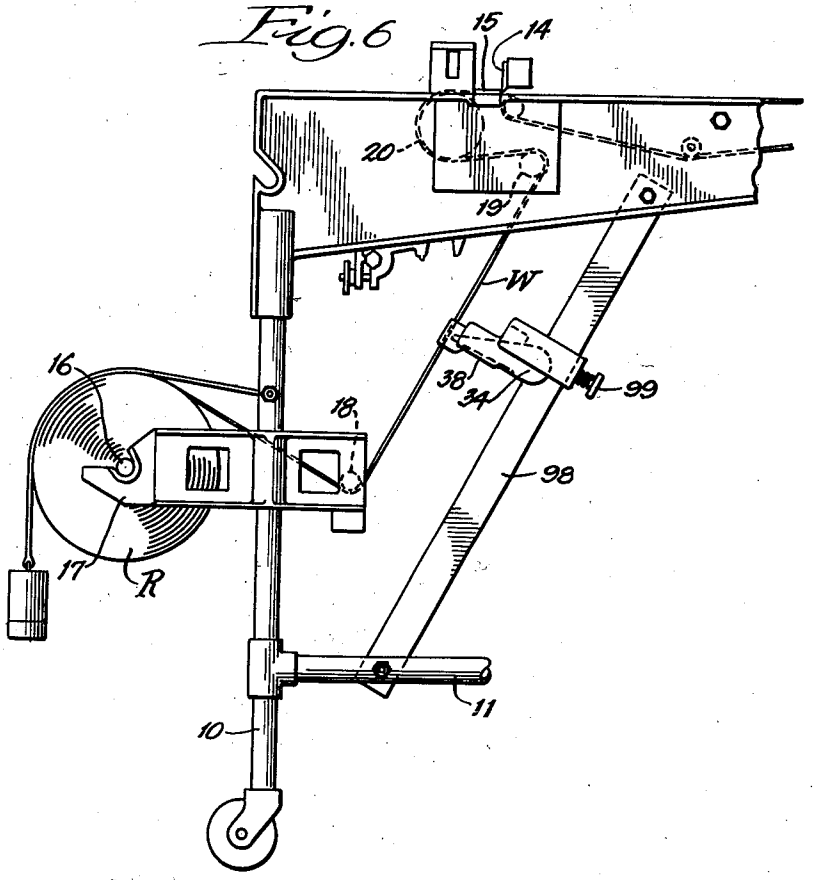
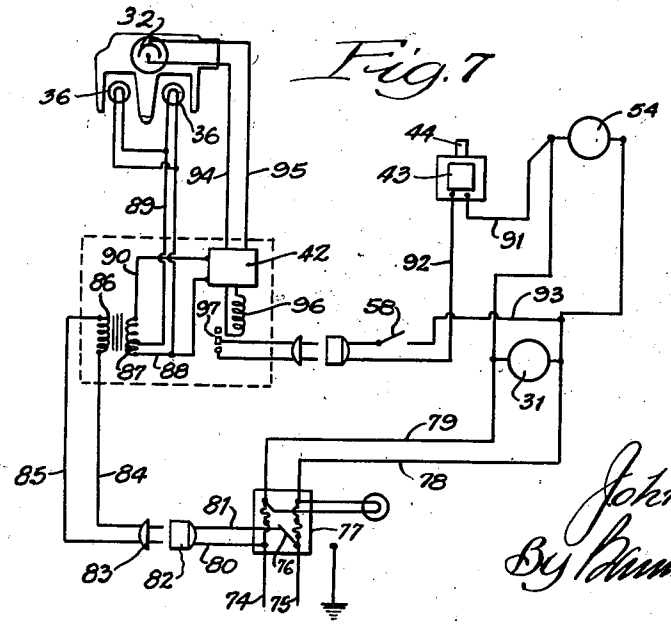


Fig. 7



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2,272,408

UNITED STATES PATENT OFFICE

2,272,408

SHEET FEEDING AND CUTTING MECHANISM

John A. Heckman, Chicago, Ill., assignor to Miller Wrapping and Sealing Machine Company, Chicago, Ill., a corporation of Illinois

Application December 6, 1940, Serial No. 368,877

8 Claims. (Cl. 164—49)

The mechanism of the present invention is so designed as to accurately adjust the feeding speed of a web of paper, Cellophane, or the like, upon which a label, or similar matter, has been imprinted, stamped, or otherwise applied, and to cut the web into equal sections intended as individual wrappers for merchandise. In the feeding of a web thus recurrently imprinted with the intended label, or other marking, it is of major importance to so adjust the feeding speed that the cut in each instance will strike through the space intervening between the adjoining labels, since errors or inequalities in the feeding speed especially if they tend to accumulate, would soon result in the severance of the sections through the labels rather than through the space intervening between the labels.

Due to the effect of humidity or other local conditions, it is extremely difficult to maintain exact accuracy in the mechanical feeding of the web, since even slight variations in the intended length of the feed will rapidly accumulate, and it is to meet this condition that the special devices of the present invention have been developed.

Briefly stated, the present invention employs mechanical means for the regular feeding of the web sections to the cutting point, at a uniform rate, with the further provision of a photo-electric cell or "electric eye" which will, as occasion requires, step-up the feeding speed of the web to compensate against an accumulation of inaccuracies sufficient in the aggregate to materially displace the advancing web from the intended cutting line, so that such displacement will never accumulate to an extent which will result in cutting the web through an imprinted label.

The stimulating of the electric eye can be accomplished by the imprinting of special lines or dots on the web to which the electric eye is responsive, or by variations in color tone occasioned by a portion of the label itself, but in either event, when the imprinted matter becomes displaced in sufficient degree away from the intended cutting line to cause a variation in the current flow through the electric eye, mechanism will be set in motion to step up the feeding speed sufficiently to restore the web to its intended position, after which the electric eye will cease to actively function until another displacement of the web occurs in sufficient amount to require further readjustment.

In order to accomplish the intended result, it is essential that the mechanical feeding speed be limited in amount, so that when errors occur they will result in an under-feeding rather than an over-feeding of the web in the present exemplification of the invention, although the principle involved is applicable to over-feeding as well as under-feeding.

Further objects and details will appear from the description of the invention in conjunction with the accompanying drawings, wherein—

Figure 1 is a side elevation of a web feeding and cutting machine embodying the principles of the present invention;

Fig. 2 is an enlarged detail of the cam and associated mechanism for regulating the position of a mercury switch which controls the flow of current to the step-up mechanism;

Fig. 3 is a detail partly in section showing the electric eye adjustably mounted in proper relation to the advancing web;

Fig. 4 is a sectional view taken on line 4—4 of Fig. 3, with the addition of mechanism for stepping up the feeding speed as occasion requires;

Fig. 5 is a perspective view showing the electric eye in relation to the web surface;

Fig. 6 is a section of the machine showing the electric eye mounted in a different position with respect to the surface of the web; and

Fig. 7 is a diagram showing the wiring for the electric eye and other mechanisms involved in the stepping up of the feeding speed.

The machine for mechanically feeding the web of paper, Cellophane, or the like, is of the general character illustrated in my co-pending application, Serial No. 315,561, filed January 25, 1940, and it is not deemed necessary to describe all of the details of the machine except in so far as the same are related to the special features of the present invention.

Briefly stated, the machine is built into a table-like frame comprising four legs or standards 10 at the four corners, which are suitably connected near the base by side and cross rails 11, and are connected at the top by longitudinally extending castings 12 which carry a suitable platform or table top 13, along which the web travels to the cutting knife or shear blade 14, best shown in Fig. 4. The shear blade 14 cooperates with a fixed shear blade 15 over which the web W passes and which affords the cutting line for severing the web into sections with each oscillation of the shear blade. The web W is fed from a roll R carried by a spindle 16 which has its ends journalled within recessed brackets 17 secured to the rear legs of the table

frame, and the web is fed forward under an idler roll 18, thence diagonally upward and over an idler roll 19 slightly to the rear of the cutting point.

The feeding roll 20 is intermittently actuated in the forward direction only by a rack bar 21 and a suitable ratchet, so that with each feeding thrust of the rack the web will be advanced a predetermined amount and there held stationary for a moment while the knife descends to sever a section of predetermined length, the feeding roll remaining idle during the return movement of the rack bar.

The lower end of the bar is pivoted to a collar 22 slidably mounted upon an oscillating arm 23 carried by a rock shaft 24 having secured thereto an arm 25 actuated by a link 26 connected with a crank 27 on a shaft 28, which may be connected by a clutch 29 with a gear 30, which forms part of a reduction train driven by a motor 31 mounted upon the frame of the machine.

It is obvious from the above description that as the crank 27 is constantly rotated it will impart oscillating movements to the rock shaft 24 and thus impart a thrust of the desired range to the rack bar 21. This mechanical feeding mechanism is set forth in full detail in my copending application previously referred to, so that it is not deemed necessary to describe the same in further detail.

It is preferred to adjust the thrust of the feeding rack 21 so that if inaccuracies in the feeding range occur they will be in the nature of deficiencies in the feeding range rather than excesses, although, subject to this requirement, it is of course desirable to adjust the feeding range as accurately as possible.

The compensating or step-up mechanism which particularly forms the subject matter of the present invention will now be described in full detail, since the same may be applied to various types of web feeding mechanism and need not be associated with a mechanical feed of the particular character just described.

The electric eye assembly which is particularly illustrated in Figs. 3 and 4 is adjustably mounted and preferably located at a point closely adjacent the cutting line. This assembly comprises a photo-electric cell 32 which is connected through a conductor cord 33 with the mechanism presently to be described.

As shown in Fig. 3, the photo-electric cell is housed within a casing 34 which is provided with a downwardly extending tapered tube 35 open at its tip end at a point closely adjacent to the surface of the web. Since in the form shown the electric eye is responsive to variations in color or intensity in reflected light, it is desirable to afford strong illumination for the surface of the web at a point immediately adjacent to the tip of the tapered tube 35, and for this purpose light bulbs 36—36 are provided which are plugged into sockets 37 and are shielded by a depending screen 38, so that the intense illumination will be confined largely to a section of the web closely adjacent to the portion within the visible range of the photo-electric cell.

The assembly as a whole is mounted upon a transverse bridge bar 39 carried by legs 40 upstanding from the table top, which permits the eye to be adjusted to the desired position, and in order to steady the web at a point closely adjacent the tip of the tube 35 a weighted roller 41 is provided, which compresses the web against the feeding roll 20 and additionally serves to prevent displacement of the web when subjected to the cutting pressure of the knife blade.

Fig. 5 illustrates a section of the web with the cutting line indicated by a dotted line and with a mark or spot S imprinted upon the web in close adjacency to the forward edge of the imprinted surface constituting the label, decoration, or other marking. The spot S, being in contrasting color tone to the surface of the web, if it comes into register with the electric eye, will serve to vary the current flow through the electric eye, and thus set in motion the step-up mechanism for restoring the web to its proper position with relation to the cutting line. Although a separate spot is here shown for purposes of convenience, it is obvious that a portion of the label imprint itself might serve a like function, but in either event, when the web has been retarded through a succession of deficiencies in the feeding range, to bring the spot into register with the photo-electric cell, the step-up mechanism will be actuated before the displacement becomes sufficient to occasion a cutting of the web through the label imprint.

The photo-electric cell is connected through the conductor cord 33 with a suitable form of relay or amplifier 42 of any improved type which will be energized by the feeble current variation occasioned by the actuation of the photo-electric cell, so that a sufficiently strong current will be transmitted to energize the coil of a solenoid 43 having an armature bar 44, which is normally held elevated by a spring 45 but which will be retracted when the solenoid is energized.

The upper end of the armature bar 44 engages a lever 46 which is normally held in the dotted line position shown in Fig. 4. The lever is pivoted upon the shaft 47 which mounts a ratchet 48 and a spur gear 49 in train with a spur gear 50 on the shaft of the rack actuated feeding roll 20. The opposite end of the lever 46 carries a roller 51 which, when lowered by the retraction of the armature bar 44, will ride upon the surface of an eccentric 52 carried by a shaft 53, which forms part of a reduction gear train constantly driven by a motor 54. When the roller 51 is free to descend to engage the eccentric, as shown in Fig. 4, it will have a lifting movement imparted to it through the range indicated by the full line and dotted line positions shown in Fig. 4.

The lever 46 pivots a dog 55 which engages the teeth of the ratchet 48, and when the lever is depressed by the retraction of the armature bar 44, the dog will ride over one or several teeth of the ratchet, so that with the lifting of the lever by the eccentric 52, a slight forward feeding movement will be imparted to the ratchet and the spur gears 49 and 50, which steps up the feeding roll 20 to the extent required to bring the web into proper relation to the cutting line.

The range of movement imparted to the ratchet will be properly calculated with reference to the loss in the position of the web required to actuate the photo-electric cell, so that the momentary retraction of the armature bar will lower the lever 46 sufficiently to displace the dog 55 by the amount required to impart step-up movements in number and amount required to restore the web to the proper position.

In order to prevent the tooth of the dog from constantly riding upon the surface of the ratchet 48, a tail piece 56 is provided which, when the lever 46 is normally elevated, will be engaged by a fixed stop 57, which thus holds the tooth of the

dog slightly elevated so that it will not scrape upon the surface of the ratchet.

It is desirable that the photo-electric cell stand in closed circuit relation to the solenoid only during the short interval of time when its services may be required in the stepping up of the web, and that during the remainder of the time while the web is in sufficiently close register the current flow be interrupted, and in order to attain this result a mercury switch 58 is provided, which is mounted upon a swinging plate 59 (Fig. 2) which is pivotally hung at its rear upper corner upon a pintle 60 outwardly projecting from the arm 61 carried by a plate 62 fixedly mounted upon one of the side rails 26 of the frame.

The mercury switch, in the substantially horizontal position shown in Fig. 2, is in the "on" or switch closing position, so that, with the switch thus adjusted, and if the photo-electric cell be meanwhile stimulated, a current will flow to the solenoid during a short interval of time, and until the swinging plate 59 drops down into the dotted line position shown in Fig. 2. The swinging plate will be momentarily displaced during each complete rotation of the crank 27 which imparts the recurrent normal feeding movements to the web. This displacement is occasioned by the contact of the cam shoe 63 which is carried by a lug 64 depending from the crank 27, so that, with each cycle of movement of the web feeding rack 21, and during the short interval covering the pause of the web at the cutting line and the return of the feeding rack bar, the cam shoe will engage the swinging plate 59 and bring the mercury switch 58 to the proper position to energize the solenoid if the spot S on the web at the same instant comes within the range of the photo-electric eye, due to a sufficient displacement of the web to require its restoration to the intended position.

In order to prevent any over-running of the feeding train, a roller 65 is mounted upon the far side of the lug 64, which roller will recurrently engage the lower arm 66 of a bell crank lever pivoted at 67, and having its upper arm 68 normally drawn downwardly by a coil spring 69 connected to an adjusting screw 70. The arm 66 of the bell crank is provided near its lower end with a notch 71, and when the roller 65 has ridden down to the lower end, it will enter the notch and be arrested, so that the feeding of the web will be suspended at the proper point during the cutting operation. The movement of the bell crank can be regulated by a stop screw 72 which can be adjusted to the desired position to engage a fixed stop 73.

In the wiring diagram, the line wires 74 and 75 lead to a switch 76 in a switch box 77, and are connected through fuses to right hand circuit comprising wires 78 and 79, and connected directly with a left hand circuit comprising wires 80 and 81 leading to a socket 82 adapted to receive a plug 83 connecting with wires 84 and 85 which carry the primary 86 to a step-down transformer. The secondary 87 connects with circuit wires 88, 89 and 90. The wires 88—89 lead through parallel circuits to the illuminating lamps 36, and the wires 88—90 lead to the amplifier 42.

The mercury switch 58 normally stands open within a circuit which comprises wires 78 and 79, and wires 91, 92 and 93. The motors 31 and 54 are in circuit with the wires 78 and 79, and the solenoid 43 is in circuit with the wires 91 and 92. The photo-electric cell is connected with the amplifier through wires 94 and 95, and when the mercury switch 58 stands closed, and simultaneously variations of current flow occur in the photo-electric circuit, including an induction coil 96, such variations serve to close a relay switch 97, so that with the relay switch and the mercury switch both closed, the solenoid 43 will be energized and the armature bar 44 drawn down to release the lever 46 for engagement with the eccentric 53, which imparts one or more step-up movements to the ratchet and feeding train connected therewith.

Although the electric eye assembly has been shown mounted in a position above the table top and adjacent to the cutting line, it is not essential that it be so located, and in Fig. 6 I have shown an arrangement in which the electric eye assembly is slidably mounted upon an obliquely disposed guide bar 98 secured to the frame in parallel relation to the obliquely traveling run of the web between the guide rolls 18 and 19. In this arrangement the position of the electric eye assembly can be suitably adjusted with respect to the divisions between the labels imprinted on the web and held in adjusted position by a screw 99 or the like. In other respects, however, the construction shown in Fig. 6 is identical with that heretofore described, and it will be understood that the location and method of adjustment of the electric eye can be otherwise varied to conform to the structural requirements of the machine with which the electric eye assembly is associated.

Operation

In operation, with the clutch 29 engaged, the crank 27 will be constantly rotated, which imparts oscillating movements to the rock shaft 24, which actuates the rack bar 21 to impart, on each active thrust, an advance of the web substantially equal to the intended length of the sections to be severed. By adjusting the throw of the rack bar, the feeding stroke can be closely regulated, care being exercised, however, not to permit over-feeding of the web. If the web is under-fed by a minute amount during each feeding movement, these errors in adjustment will accumulate until a suitable mark or other color variation on the web will finally come into register with the line of sight of the photo-electric cell, which will thus introduce an interruption in the normal reflection of light rays impinging upon the cell.

Since each rotation of the feeding crank 27 momentarily displaces the swinging plate 59 which carries the mercury switch 58, the solenoid circuit will be at least partially closed during each instant while the gap between successive labels imprinted on the web is at rest at or near the cutting line. If, therefore, during one of these pauses in the web feed the photo-electric cell is also stimulated by the mark or spot S, or the like, to impart a feeble current variation sufficient in amount to actuate the relay, a strong enough current will be sent through the solenoid to draw down the armature bar 44, and thus permit the roller 51 to descend and be engaged by the constantly rotating eccentric 52, so that the dog 55 will thus impart one or more step-up strokes to the ratchet 48 and through the feeding train to the feeding roll 20, thus stepping up the web until the mark S is stepped out of range of the photo-electric cell. It will thus be seen that the photo-electric cell, when occasion requires, merely initiates the train of operations

involved in stepping up the web, by tripping the roller 51 so that the mechanisms which actually step up the feed are timed to occur at the proper intervals.

Although for purposes of illustration I have shown a photo-electric cell responsive to light reflected from the web surface, it will of course be understood that the light rays might be transmitted through the web, and that in the claims, where reference is made to light from the web, it will be understood to include either reflected or transmitted light of a character to cause a change in current flow through the photo-electric cell.

Although the invention has been described with particularity as to detail, it is not the intention, unless otherwise indicated in the claims, to limit the invention in the form shown, since numerous modifications in detail may be introduced without departing from the principle of the invention.

I claim:

1. In a machine of the class described, the combination of web feeding devices adapted normally to advance a continuous web by predetermined lengths, cutting means for severing such lengths into substantially equal sections from the web, step-up feeding means for additionally advancing the web, said means including a ratchet and gear train leading to the normal web feeding devices, a lever carrying a dog adapted to engage said ratchet and means adapted to actuate said lever when it is free to coact with said means, a photo-electric cell positioned in proximity to the web surface and responsive to predetermined variations in light rays from the web, and means adapted to be actuated by variations in the current flow through the photo-electric cell for permitting said lever to move into coacting relationship with said lever actuating means to impart a step-up feeding movement through the dog and the ratchet and gear train to the web feeding devices, and means for limiting the time of initiating the coaction of said actuating means by the photo-electric cell to a fraction of the time involved in each normal feeding movement of the web, said means including a mercury switch normally open and a device for tilting said mercury switch to close the same momentarily during each cycle of movement of the web feeding mechanism.

2. In a machine of the class described, the combination of web feeding devices adapted normally to advance a continuous web by predetermined lengths, cutting means for severing such lengths into substantially equal sections from the web, step-up feeding means for additionally advancing the web, said means including a ratchet and gear train leading to the normal web feeding devices, a lever carrying a dog adapted to engage said ratchet and means adapted to actuate said lever when it is free to coact with said means, a photo-electric cell positioned in proximity to the web surface and responsive to predetermined variations in light rays from the web, and means adapted to be actuated by variations in the current flow through the photo-electric cell for permitting said lever to move into coacting relationship with said lever actuating means to impart a step-up feeding movement through the dog and the ratchet and gear train to the web feeding devices, and means for limiting the time of initiating the coaction of said actuating means by the photo-electric cell to a fraction of the time involved in each normal feeding movement of the web, said means including a mercury switch carried by a tilting plate and normally standing in open circuit relation, and a device carried by the web feeding mechanism and adapted during each cycle of movement to tilt the plate and momentarily close the circuit through the mercury switch.

3. In a machine of the class described, the combination of a web feeding roll having a ratchet for intermittently rotating the same in a feeding direction, a rack bar adapted to coact with the ratchet to feed the roll only on each forward feeding thrust of the rack bar, to advance a continuous web by predetermined lengths, cutting means for severing such lengths into substantially equal sections from the web, a ratchet in train with the web feeding roll for effecting a step-up feeding of the roll independently of the normal feeding movements imparted by the rack bar, a dog coacting with said ratchet, a swinging lever carrying the dog and adapted when oscillating to cause the dog to impart feeding movements to the ratchet, constantly operating means adapted to impart oscillating movements to the lever when the same is brought into coacting relation therewith, a solenoid having an armature bar adapted when the solenoid is de-energized to hold the lever out of coacting relation with the constantly operating means, a photo-electric cell positioned in proximity to the web surface and responsive to predetermined variations in light rays from the web and adapted when actuated to effect partial closure of an energizing circuit to the solenoid, and means for limiting the time for effecting the full closure of the solenoid circuit by the photo-electric cell to a fraction of the time involved in each normal feeding cycle of the web.

4. In a machine of the class described, the combination of a web feeding roll having a ratchet for intermittently rotating the same in a feeding direction, a rack bar adapted to coact with the ratchet to feed the roll only on each forward feeding thrust of the rack bar, to advance a continuous web by predetermined lengths, cutting means for severing such lengths into substantially equal sections from the web, gearing in train with the web feeding roll for effecting a step-up feeding of the roll independently of the normal feeding movements imparted by the rack bar, a ratchet connected with said gearing for imparting step-up feeding movements thereto, a dog coacting with said ratchet, a swinging lever carrying the dog and adapted when oscillating to cause the dog to impart feeding movements to the ratchet, a constantly rotating cam adapted to impart oscillating movements to the lever when the same is brought into coacting relation therewith, a solenoid having an armature bar adapted when the solenoid is de-energized to hold the lever out of coacting relation with the constantly rotating cam, a photo-electric cell positioned in proximity to the web surface and responsive to predetermined variations in light rays from the web and adapted when actuated to effect partial closure of an energizing circuit to the solenoid, and means for limiting the time for effecting the full closure of the solenoid circuit by the photo-electric cell to a fraction of the time involved in each normal feeding cycle of the web.

5. In a machine of the class described, the combination of a web feeding roll having a ratchet for intermittently rotating the same in a feeding direction, a rack bar adapted to coact

with the ratchet to feed the roll only on each forward feeding thrust of the rack bar, to advance a continuous web by predetermined lengths, cutting means for severing such lengths into substantially equal sections from the web, gearing in train with the web feeding roll for effecting a step-up feeding of the roll independently of the normal feeding movements imparted by the rack bar, a ratchet connected with said gearing for imparting step-up feeding movements thereto, a dog coacting with said ratchet, a swinging lever carrying the dog and adapted when oscillating to cause the dog to impart feeding movements to the ratchet, constantly operating means adapted to impart oscillating movements to the lever when the same is brought into coacting relation therewith, a solenoid having an armature bar adapted when the solenoid is de-energized to hold the lever out of coacting relation with the constantly operating means, a photo-electric cell positioned in proximity to the web surface and responsive to predetermined variations in light rays from the web and adapted when actuated to effect partial closure of an energizing circuit to the solenoid, and means for limiting the time for effecting the full closure of the solenoid circuit by the photo-electric cell to a fraction of the time involved in each normal feeding cycle of the web, said means including a mercury switch normally open, and a device for tilting said mercury switch to close the same momentarily during each cycle of movement of the web feeding mechanism.

6. In a machine of the class described, the combination of a web feeding roll having a ratchet for intermittently rotating the same in a feeding direction, a rack bar adapted to coact with the ratchet to feed the roll only on each forward feeding thrust of the rack bar, to advance a continuous web by predetermined lengths, cutting means for severing such lengths into substantially equal sections from the web, gearing in train with the web feeding roll for effecting a step-up feeding of the roll independently of the normal feeding movements imparted by the rack bar, a ratchet connected with said gearing for imparting step-up feeding movements thereto, a dog coacting with said ratchet, a swinging lever carrying the dog and adapted when oscillating to cause the dog to impart feeding movements to the ratchet, a constantly rotating cam adapted to impart oscillating movements to the lever when the same is brought into coacting relation therewith, a solenoid having an armature bar adapted when the solenoid is deenergized to hold the lever out of coacting relation with the constantly rotating cam, a photo-electric cell positioned in proximity to the web surface and responsive to predetermined variations in light rays from the web and adapted when actuated to effect partial closure of an energizing circuit to the solenoid, and means for limiting the time for effecting the full closure of the solenoid circuit by the photo-electric cell to a fraction of the time involved in each normal feeding cycle of the web, said means including a mercury switch normally open, and a device for tilting said mercury switch to close the same momentarily during each cycle of movement of the web feeding mechanism.

7. In a machine of the class described, the combination of a web feeding roll having a ratchet for intermittently rotating the same in a feeding direction, a rack bar adapted to coact with the ratchet to feed the roll only on each forward feeding thrust of the rack bar, to advance a continuous web by predetermined lengths, cutting means for severing such lengths into substantially equal sections from the web, gearing in train with the web feeding roll for effecting a step-up feeding of the roll independently of the normal feeding movements imparted by the rack bar, a ratchet connected with said gearing for imparting step-up feeding movements thereto, a dog coacting with said ratchet, a swinging lever carrying the dog and adapted when oscillating to cause the dog to impart feeding movements to the ratchet, constantly operating means adapted to impart oscillating movements to the lever when the same is brought into coacting relation therewith, a solenoid having an armature bar adapted when the solenoid is de-energized to hold the lever out of coacting relation with the constantly operating means, a photo-electric cell positioned in proximity to the web surface and responsive to predetermined variations in light rays from the web and adapted when actuated to effect partial closure of an energizing circuit to the solenoid, and means for limiting the time for effecting the full closure of the solenoid circuit by the photo-electric cell to a fraction of the time involved in each normal feeding cycle of the web, said means including a normally open tiltably mounted mercury switch in the solenoid circuit, and a constantly rotating cam shoe adapted during each feeding cycle to momentarily tilt the mercury switch mounting to close the mercury switch and effect a closure of that portion of the solenoid circuit.

8. In a machine of the class described, the combination of a web feeding roll having a ratchet for intermittently rotating the same in a feeding direction, a rack bar adapted to coact with the ratchet to feed the roll only on each forward feeding thrust of the rack bar, to advance a continuous web by predetermined lengths, cutting means for severing such lengths into substantially equal sections from the web, gearing in train with the web feeding roll for effecting a step-up feeding of the roll independently of the normal feeding movements imparted by the rack bar, a ratchet connected with said gearing for imparting step-up feeding movements thereto, a dog coacting with said ratchet, a swinging lever carrying the dog and adapted when oscillating to cause the dog to impart feeding movements to the ratchet, a constantly rotating cam adapted to impart oscillating movements to the lever when the same is brought into coacting relation therewith, a solenoid having an armature bar adapted when the solenoid is de-energized to hold the lever out of coacting relation with the constantly rotating cam, a photo-electric cell positioned in proximity to the web surface and responsive to predetermined variations in light rays from the web and adapted when actuated to effect partial closure of an energizing circuit to the solenoid, and means for limiting the time for effecting the full closure of the solenoid circuit by the photo-electric cell to a fraction of the time involved in each normal feeding cycle of the web, said means including a normally open tiltably mounted mercury switch in the solenoid circuit, and a constantly rotating cam shoe adapted during each feeding cycle to momentarily tilt the mercury switch mounting to close the mercury switch and effect a closure of that portion of the solenoid circuit.

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