

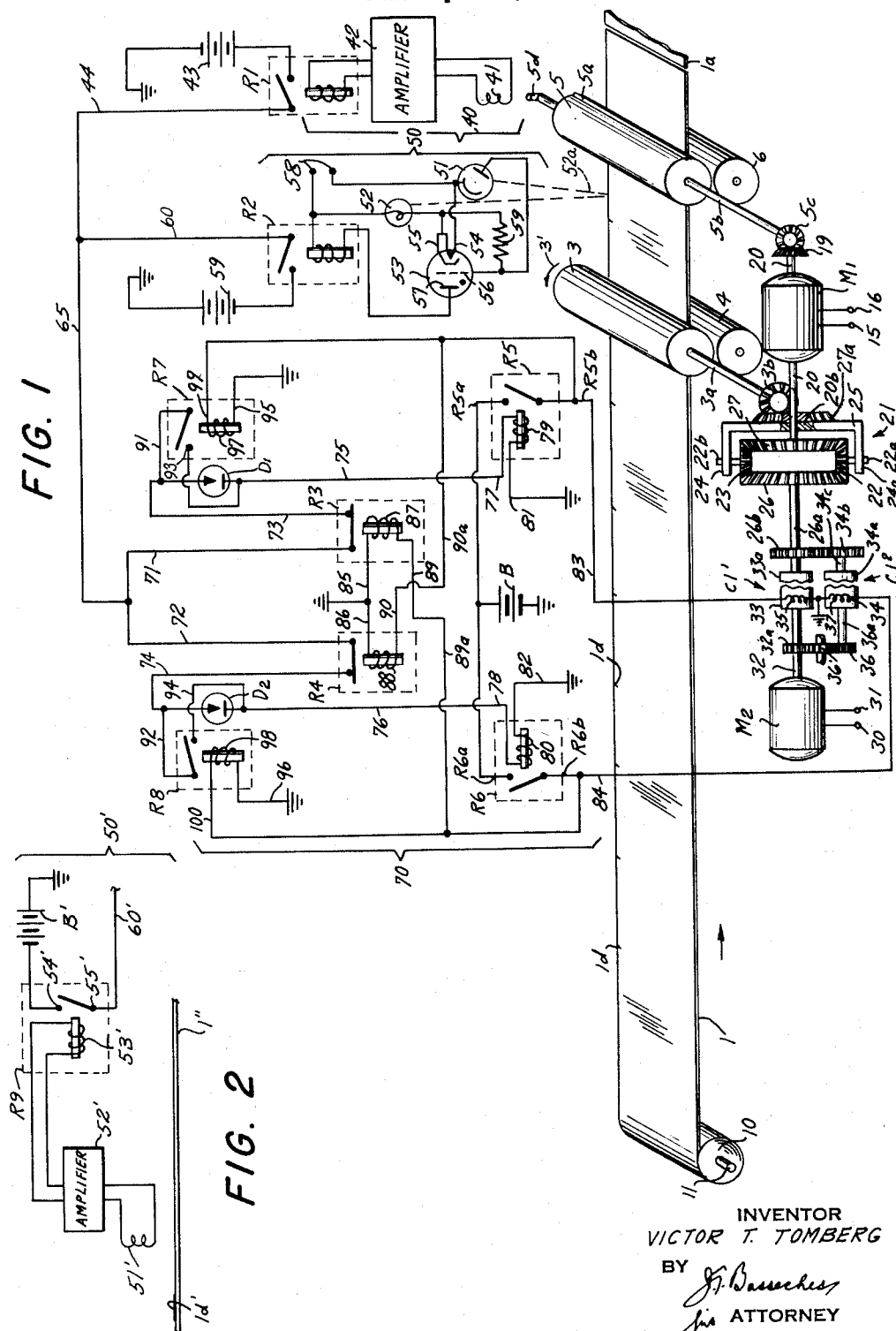
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PROPORTIONING CONTROL DEVICE

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1

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PROPORTIONING CONTROL DEVICE

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This invention relates to a web feed device and more particularly relates to a device wherein a web of material is fed at a controlled rate to apparatus acting upon or modifying the web. Still more particularly, this invention relates to a proportioning control device for one or more webs of material having improved corrector means for varying the rate of web feed to maintain a co-ordinated relationship between the web or webs and/or a modifying apparatus.

More particularly, this invention relates to a device for feeding in synchronized relation a web or strip of material bearing continuous repeats of a design or printed matter, for instance, to a modifying apparatus such as a cut-off knife or the like. Further this invention relates to a positioning device wherein one or more webs may be fed in oriented relation to each other or to a modifying device.

It is imperative that the knife enter the web to sever the latter at an accurately predetermined position with respect to designs or units of printed matter of the web so that in each discrete unit formed, the printed matter will be centered or bear some other desired spatial orientation to the marginal edges. While the invention is described herein in connection with a modifying apparatus comprising a cut-off knife, it will readily be understood that other modify devices, as for instance a printing device, may be employed.

Web feed units generally employ a drive in the form of rollers or the like, which draw the web linearly toward a processing station such as a cutter knife or the like. The knife is directed against the web in timed sequence to sever a desired length of the web. Due to such variables as web slippage, stretching, shrinkage, machinery lags or leads, the latter caused by enlargement of the pulley roll diameter through the adhesion of films thereto for instance, correct registration of the cutter knife with the desired point of the web is a constant problem.

This invention is concerned with a device for feeding a web at a selected relative rate of movement with respect to another web, a cut-off or other modifying device. The term "selected rate of movement" as hereinafter used, will be understood to refer to movement of the web relative to a modifying device or the like.

In the past, many expedients for assuring correct registration of the web and web processing apparatus have been suggested, examples of the latter being disclosed in my copending application Serial No. 736,847, filed May 21, 1958, now Patent No. 2,995,968, Aug. 15, 1961. Most corrective devices operate upon the principle of varying the drive roller speed in a manner to return a web to a desired relation to the knife. There is need for a corrector which will provide improved correcting results with errors of small magnitude and will thereby prevent the cumulative effect from reaching larger magnitude. In general, the ineffectiveness of correctors heretofore known to compensate for small errors has been due to two major characteristics of such devices. First, due to the relatively high inertia of the known corrective devices, considerable time elapses between the sensing of an error, and the application of a corrective torque upon the drive roller. A second and related shortcoming of known devices is their inability to apply a correction which is proportioned to the magnitude of the error detected.

2

As a result, small errors go uncorrected, since the inertia of the correcting system renders the application of slight corrective adjustments impossible. Compensation for larger errors by such systems, in the form of an accelerating or decelerating torque increment applied to the drive roller often results in over-correction and a "hunting" effect, since such known corrector systems will impart a given magnitude of correction irrespective of the magnitude of the error. For example, such devices are set to apply a corrective torque for a set, preselected period of time, say for three seconds each time an error is sensed. Application of the corrective torque for the preselected period may not sufficiently compensate for a sensed error of large magnitude, and conversely, may induce an error in the opposite direction when the sensed error is small.

It is, accordingly, an object of my invention to provide an improved web processing device. A further object of my invention is the provision of a self-correcting web processing device wherein small errors are immediately sensed and corrected, thus preventing the accumulation of large errors. A further object of my invention is the provision of a web feed device having proportioned corrector means whereby a corrective rotation is applied to the web feed mechanism for a period proportional to the magnitude of the sensed error.

Still a further object of the invention is the provision of a corrector mechanism for a web processing device capable of applying a small corrective rotation to the drive of a web processing apparatus.

Still a further object of the invention is the provision of an improved speed corrector device wherein a minimum of inertia is required to be overcome and, consequently, a minimum of time consumed in transmitting a corrective torque to the web feed mechanism.

Still a further object of this invention is the provision of novel sensing means for detecting and correcting the rate of web travel relative to another web or like modifying apparatus.

Further objects of this invention will appear herein or be hereinafter pointed out in conjunction with the accompanying drawings, in which:

FIGURE 1 is a perspective view of an embodiment of my invention, somewhat diagrammatic in nature and showing schematically the circuit diagram thereof; and

FIGURE 2 is a schematic view of an embodiment having novel sensing means for the rate of travel of the web.

In general, my invention comprises a web feed control having a first sensing means arranged to emit a signal having a particular characteristic at the passage beyond a selected point of each unit of the web.

Spaced from the first sensing means is a processing apparatus (a knife, in the illustrated embodiment), second sensing means for emitting a second signal distinguishable from the signal of the first sensing means at a selected point in the operating cycle of the processing apparatus. The first and second sensing means are co-ordinated to emit signals contemporaneously when the web is in proper registry with the processing apparatus.

The web is advanced to the processing apparatus by drive rollers. A constantly driven speed corrector is arranged upon actuation of a low inertia clutch mechanism alternatively to accelerate or decelerate the drive rollers when said signals are not contemporaneously emitted.

The output of the first and second sensing means is led to a circuit adapted to discriminate between the signals of the first and second sensing means and to actuate the clutch mechanism alternatively to accelerate or decelerate the drive rollers dependent upon the order or receipt of the signals (where the signals are not simul-

3

taneously received). The circuit triggers the clutch mechanism at the first received signal and deactivates the latter at the second received signal. Thus a corrective rotation is applied for a period the length of which is a function of the temporal separation of the first and second signals, and in a direction which is a function of the order in which the signals are received. Since the separation of the signals is proportional to the web error, and since the order of receipt of the signals will depend upon whether a lagging or leading web error has developed, the applied correction occurs in each cycle of the processing apparatus and is proportional to the magnitude of error present.

Referring now to the drawings, FIGURE 1 shows a web 1 of any appropriate material moving in a longitudinal direction from left to right. For clarity, the showing of FIGURE 1 is somewhat diagrammatic and the framework and supporting structure for the drive means and shafts have been eliminated.

A supply roll 10 of the web material is mounted on lateral shaft 11 which is preferably tensioned by some form of a variable brake or tensioning device (not shown). The web 1 passes through draw rollers 3 and 4, the roller 3 being driven in the direction of arrow 3' by drive mechanism to be hereinafter described, and roller 4 in the illustrated embodiment comprising an idler roller. The web 1, after passing through rollers 3, 4, passes beneath knife roller 5 and mated idler roller 6, the knife roller being provided with the usual cut-off blade 5a. It will be readily understood that while the web modifying apparatus illustrated in FIGURE 1 is a cut-off apparatus, other modifying devices such as printing mechanism, for instance, or means for securing the feed web to another web, may be substituted for or used in conjunction with the cut-off mechanism. The cut-off blade 5a severs successive discrete pieces 1a from the web, which pieces may be used, for instance, to form box blanks, as wrappers for candy, gum or the like.

The rollers 3 and 5 are supplied with primary motive power through main drive motor M1, the input terminals 15, 16 of which are connected to a suitable power source. The shaft 5b of knife roller 5 is geared by bevel gear 5c to complementary bevel gear 19 carried by shaft 20 of motor M1.

The shaft 3a of drive roller 3 is driven through a differential mechanism 21 primarily powered by motor M1. The differential 21 comprises opposed bevel gears 22, 23, having stub shafts 22a, 22b, respectively, rotatably mounted on opposed arms 24, 24a, of framework or spider 25. A second pair of opposed bevel gears 26, 27 are positioned so that each gear 26, 27 is meshed with gears 22 and 23.

Gear 26 is linked to the speed corrector mechanism, to be hereafter described, by shaft 26a. Gear 27 is driven by shaft 20 of motor M1, said shaft 20 passing rotatably through bearing 20b formed in the differential framework 25.

Roller 3 is linked to the differential 21 by bevel gear 3b carried by shaft 3a, the gear 3b being meshed with a complementary gear 27a secured to the framework or spider 25 of the differential.

From the above described mechanism, it will be readily recognized that knife roller 5 and drive roller 3 will be normally turned at constant rates which rates are functions of the speed of rotation of motor M1. However, when a corrective rotation is applied to the shaft 26a by the corrector mechanism, the roller 3 will be rotated at a greater or lower rate dependent upon the direction of rotation imparted to the shaft 26a.

Motive power for the corrector mechanism is supplied by corrector motor M2 having input terminals 30, 31, connected to a source of power. The drive shaft 32 of motor M2 is connected to drive the rotating disks or diaphragms of a pair of electrically operated clutches C¹ and C². While clutches C¹, C² are illustrated as

4

including normally spaced elements which are coupled by energizing a field coil, it will be understood that other known clutches may be substituted, such as those having normally contacting slipping elements linked by energization of the field core. Disk or field element 33 of C¹ is coupled directly to shaft 32, while field element or disk 34 of clutch C² is driven in the same direction as disk 33 by gears 32a, 36' and 36, and gear 36 being linked to disk or diaphragm 34 by shaft 36a.

The electrically operated clutches C¹, C² are normally in open or disengaged condition whereby no driving connection is formed between driver diaphragm 33 and its complementary driven or armature element 33a of clutch C¹, or between diaphragm 34 and its complementary driven or armature element 34a of clutch C².

Connector 33a is coupled directly to input shaft 26a of the differential 21. A gear 26b mounted on shaft 26a is meshed with gear 34b linked by stub shaft 34c to clutch element 34a.

The above mechanism will be readily recognized to produce a condition in which elements 34, 34a of clutches C¹, C², respectively, are constantly being rotated by motor M2 in the same direction. When elements 33, 33a of clutch C¹ are engaged by the passage of current through coil 35, shaft 26a will be rotated in the direction of the motor M2. Contrariwise, when elements 34, 34a are engaged by energizing coil 37 of clutch C², shaft 26a will be rotated in the opposite direction to the direction of rotation of shaft 32 of motor M2 by reason of the geared connection provided by gear members 34b and 26b. Thus it will be seen that when clutch C¹ is energized, a correction in one sense will be applied through differential 21 to drive roller 3, and when clutch C² is energized, the correction applied to roller 3 will be in the opposite sense.

Clutches C¹ or C² are selectively and alternatively energized responsive to the sense of a detected error, and maintained in engaged relationship for a period proportionate to the magnitude of the detected error by an error sensing and control system now to be described.

The sensing and control system includes a first detector 40 operating with the web modifying (knife roller) assembly, and arranged to emit a signal of selected polarity (in this case, positive) each time the knife blade 5a reaches a predetermined position with respect to the web 1. In the illustrated embodiment a permanent magnet 5d is carried by shaft 5b to be rotatable therewith. A coil 41 is positioned to be influenced by the magnetic field of the magnet 5d, at a selected point in the rotation of shaft 5b. The current induced in coil 41 as the magnet 5d passes the coil is amplified in a suitable amplifier 42, the output of which momentarily closes the contacts of normally open relay switch R1. When the contacts of relay switch R1 are closed, the positive terminal of battery 43, or other suitable source of power, is connected to output lead 44 of detector 40, the negative terminal of the battery 43 being grounded.

In predetermined spaced relation to the knife detector unit 40 there is positioned a photoelectric detector assembly 50 arranged to sense the speed of the web 1. The web is provided with equally spaced apart index markings 1d which are related in predetermined manner with desired cut-off points of the web.

The detector assembly 50, which is conventional in design, includes a photoelectric cell 51 having an exit lamp 52. The light of lamp 52 is directed by any suitable optical means, not shown, in a beam 52a, so as to fall on said web in the path of movement of the index markings 1d as they shift from left to right, as shown in FIGURE 1. The beam 52a is reflected from the web onto the photocell 51 and as the index markings pass beneath the beam 52a, the intensity of the reflected light beam as received by the photocell is varied.

Any suitable amplification circuit may be employed in

5

conjunction with photocell 51. Optionally, and without limitation, this circuit may include a thyatron tube having a heater 54, cathode 55, grid 56, and plate 57. The heater 54 is connected in series with lamp 52 and terminals 58 which are connected to a suitable power source. The cathode 55 is connected with the connection of heater 54 and lamp 52. Plate 57 connects to one end of the coil of normally open relay switch R2, the remote end of said coil being connected to one of the terminals 58.

A bypass resistor 59 is connected between the grid 56 and the cathode 55. One terminal of the photocell 51 is connected to the grid 56, the other terminal of said photocell being connected to the terminal 58 remote from the terminal connector to the coil of relay switch R2.

When the intensity of the light beam 52a on the photocell is changed by the passage of an index marker 1d, the resulting activation of photocell 51 charges the grid 56, permitting a current flow from the cathode 55 to the plate 57 causing a current flow in the coil of relay R2 and causing the normally open contacts of said relay to close temporarily. When the contacts of relay R2 close, the negative terminal of battery 59 or other suitable source of D.C. current is connected to the output lead 60 of the photocell detector unit 50, the positive terminal of battery 59 being grounded.

The output leads 44 and 50 of the detectors 40 and 50, respectively, are connected to a discriminating or gating circuit next to be described, which circuit functions to activate one or the other of the clutches C¹, C², dependent upon the polarity of the first received detector signal, and to maintain the activated clutch in energized condition until the clutch is deactivated by the impression on such circuit of the second received detector signal.

The gating or discriminator circuit 70 includes a pair of normally closed relay switches R3, R4, the input terminals of which switches are connected by branch leads 71, 72, respectively to conduit 65 connected to the output leads 44 and 60 of the detectors 40 and 50, respectively.

The output terminal of relay switch R3 is connected through lead 73 to a rectifier such as a diode D1. In like manner the output switch terminal of relay R4 is connected through lead 74 to diode D2. The diodes D1 and D2 may be semi-conductors, vacuum tubes or the like. Diodes D1, D2 function, as will be readily understood, to pass freely an impressed voltage of a selected polarity but to block passage of an impressed electromotive force of the opposite polarity.

The output of diode D1 is connected through conductor 75 to one terminal 77 of coil 79 of relay R5, the other terminal 81 of coil 79 being grounded. In like manner, the output of diode D2 is connected through conductor 76 to one terminal 78 of coil 80 of relay R6, the other terminal 82 of coil 80 being grounded.

The input switch terminals R5a, R6a of relays R5 and R6, respectively, are connected to the positive terminal of battery B, the negative lead of said battery being grounded. The ungrounded terminals of coils 35, 36 of clutches C¹, C², respectively, are connected respectively to the output switch terminals R5b, R6b of relays R5, R6, respectively, by conductors 83, 84, respectively.

One terminal 85 of coil 87 of relay R3 is grounded, and the other terminal 89 of said coil is connected by conductor 89a to output terminal of R6b of relay R6. Similarly, one terminal 86 of coil 88 of relay R4 is grounded and the other terminal 90 of said coil is connected by conductor 90a to output terminal R5b of relay R5.

A pair of bypass relay switches R7 and R8 are wired in parallel with diodes D1, D2, respectively. The switching contacts of relays R7, R8 are normally open.

The contacts 91, 93 of relay R7 are connected to conductors 73, 75, respectively, and contacts 92, 94 of relay R8 are connected to conductors 74, 76, respectively. It will thus be apparent that when the contacts of relays

6

R7 and R8 are closed, an alternate or shunting current path is provided around diodes D1 and D2, respectively.

One lead 95 of relay coil 97 of relay R7 is grounded, the other lead 99 of said coil being connected to the switch output terminal R5b of relay R5. Similarly, one lead 96 of relay coil 98 of relay R8 is grounded and the other lead 100 of said coil is connected to the switch output terminal R6b of relay R6.

Operation

As previously indicated, if web 1 is being fed in perfectly timed relationship with the cut-off knife 5a, the negative signal emitted by the photoelectric detector 50 and the positive knife roller detector 40 are simultaneously impressed on the gating or discriminator circuit 70 and no speed correction is applied to the web. However, where the web, for example through slippage, lags, or leads, to vary from the desired synchronized position, one of the detector means will impress its signal on the gate or discriminator circuit prior to the other, the order in which such signals are impressed being dependent upon the sense of the web error, and the temporal separation of such signals being dependent upon the magnitude of the error.

If the web leads the desired synchronized position, and such leading error were uncorrected, the knife 5a would cut the web at a point rearwardly of the desired point of severance. In the embodiment of FIGURE 1, such leading error of the web would cause photocell detector 50 to impress its signal on the gating circuit 70 before that of the knife roller detector 40. Under such circumstances, a negative pulse would be applied from conductor 60 to gate circuit input conductor 65 and subsequently a positive pulse would be by the knife roller detector 40 from conductor 44 to input conductor 65.

The initial negative pulse applied by detector 50 travels along branch conductor 71, 72, through the closed switch contacts of relays R3 and R4 to conductors 73 and 74, respectively. The pulse thus is impressed through leads 73, 74 on diodes D1 and D2, respectively. Diode D1 is conductive only to a positive impressed voltage and thus there is no flow through this diode from conductor 73 to 75. Diode D2, however, is conductive to the negative signal emitted by detector 50 and thus a current is permitted to flow from conductor 74 across diode D2 through coil 80 of relay R6 and to ground. Relay R6 (and relay R5) are optionally, but preferably, high speed relays of the "polarized" type, that is, the contacts of the relay are closed by an impressed signal of one polarity and are re-set or opened by a signal of opposite polarity. It will be readily understood that mechanically timed reset relays may be employed instead of polarized relays.

The current flow through coil 80 causes the switch contacts of relay R6 to close, thereby connecting the positive terminal of battery B with relay output R6b.

The energizing of clutch coil 37 engages driven clutch element 34a with clutch driver element 34, thus communicating stub shaft 34c carrying gear 34b with shaft 36a driven by the constantly turning corrector motor M2 through gears 32a, 36 and 36'. The rotary motion is thus imparted by driven clutch disk or element 34a to shaft 34c, and meshed gears 34b and 26b to differential input shaft 26a imparting a decelerating corrective rotation through the differential 21 to drive roller 3 for the duration of the period in which current flows in clutch coil 37.

In addition to energizing clutch coil 37, the closing of terminals R6a and R6b of relay R6 energizes coil 87 of relay R3 and coil 98 of relay R8.

The energizing of relay R8 closes the normally open relay contacts and provides shunt or bypass path across diode D2 during the period in which the contacts of relay R6 are closed. The energization of relay R3 opens the normally closed contacts of that relay, preventing (until the contacts are re-set) any flow from branch

conductor 71 to conductor 73 during the period in which the contacts of relay R6 are closed.

The switch contacts of relay R6 remain closed until the positive signal developed by detector 40 is impressed on the gate or discriminator circuit 70. The positive pulse travels through branch 72 through the closed contacts of relay R4, through conductor 74, and bypasses diode D2 through the now closed contacts of normally open relay R8. The switching contacts of polarized relay R6 are opened or re-set by the flow of the positive pulse through conductor 76, coil 30, and to ground. With the opening of contacts R6a, R6b of relay R6, the coil 37 of clutch C² is de-energized, separating the driver and driven elements of the clutch and disconnecting the corrector motor M2 from any driving connection with differential 21.

With the opening of the switch contacts of relay R6, the switch contacts of relay R8 are permitted to return to their normally open condition, and contacts of relay R3 to return to their normally closed condition. It should here be noted that the function of relay R3 is to prevent any current from flowing through the conductor branch 71 when the subsequently received positive pulse from detector 40 is impressed on the gate or discriminator circuit 70. Similarly, it is the function of relay R8 to permit the positive pulse to bypass diode D2 to de-activate the relay R6.

In essence, the gate or discriminator current 70 may be considered as comprising two branches, each controlling a different clutch. The current of the first impressed signal is permitted to flow only in the branch having the diode conductive to the first impressed signal. The clutch controlled by the activated branch is energized and simultaneously the circuit to the deactivated branch is opened and a bypass around the diode of the activated branch is provided to permit passage in the activated branch of a subsequently received signal of opposite polarity. The subsequent signal re-sets the circuit to its initial condition, disengaging the activated clutch and rendering the circuit receptive to the next impressed pair of signals.

It should be understood that the invention herein is not to be taken as limited to the specific gate or detector circuits disclosed and that the latter are to be deemed illustrative only. Thus other known or hereafter developed circuits will function to engage one or another of a pair of clutches alternatively responsive to the characteristic of a first received signal and disengage the activated clutch responsive to a subsequently received signal having a differing characteristic. Similarly, it is not necessary that signals of different characteristics be emitted since it will be readily recognized that each detector may be used to control a different clutch, it being merely necessary that the first received signal, in addition to energizing one clutch, opens the circuit to the other clutch to prevent energizing of the latter by the second received signal. Accordingly, my invention is to be broadly interpreted within the scope of the appended claims.

Where extremely accurate coordination of the web and the knife or other modifying apparatus is required, it may be desirable to eliminate the relay units and employ instead well known electronic switching devices which are free from the time lag inherent in relays.

In the event that the web 1 lags the desired synchronized position with respect to the knife 5a, the positive pulse emitted by detector 40 will precede the negative pulse emitted by detector 50. This pulse will pass diode D1 closing relay R5 and activating clutch C¹, thereby applying an accelerating increment through differential 21 to drive roller 3. Simultaneously with the activation of the clutch, the switch contacts of relay R4 will be opened preventing current to flow through the conductor 72 until relay R5 is reset by a signal of opposite polarity. Also the contacts of relay R7 are closed providing a shunt

or bypass around diode D1 for the subsequently received negative pulse of detector 50. When such pulse is received, the contacts of polarized relay R5 are opened, clutch C¹ is deactivated, the contacts of relay R4 are permitted to return to their normally closed condition, and the contacts of relay R7 to their normally open condition. The circuit 70 is thus returned or reset to a condition in which it is ready to receive the next pair of signals.

In FIGURE 2 there is illustrated a novel web speed detector embodiment 50', which may be employed as a substitute for the photoelectric detector 50. In this embodiment, the web 1'' is provided with spaced markings 1d' having permanent magnetic characteristics. A coil 51' is suspended in proximate relation to the path of markings 1d', and as the same pass an electromotive force is induced in the coil 51'. The output of coil 51' is amplified in a suitable amplifier 52' which is connected across the coil 53' of a relay R9, causing the switching contacts 54', 55' to close, connecting detector output lead 60' with the negative terminal of battery B'. It will be understood that output lead 60' may be connected to gate circuit input lead 65 and will have the same effect as the detector 50.

It will be readily recognized in the light of the preceding disclosure that unlike web corrector devices heretofore known, my device will apply a web correction which is proportioned to the signal separation, and thus proportional to the magnitude of errors corrected. Also, by reason of the employment of a constantly energized corrector motor and low inertia, fast acting clutches, small speed corrective changes may be imparted to the web which changes could not be possible in the use of correctors heretofore known which require activating relatively high inertia corrector motors for application of a web speed correction.

The proportional correction and low inertia correction device minimizes hunting or over-correction and prevents the accumulation of large errors by quickly and accurately and proportionally correcting for small errors as they occur in each cycle of operation of the web modifying or positioning device.

Having thus described the invention and illustrated its use, what is claimed as new and is desired to be secured by Letters Patent, is:

1. A web feeding apparatus having drive means for drawing a web at a selected rate of movement, web processing means cyclically shifted into engagement with said web, first detector means spaced along said web from said processing means and arranged to emit a signal responsive to the passage of trigger indicia carried by said web, second detector means associated with said processing means and arranged to emit a signal at a predetermined point in the operating cycle of said processing means, said signals of said first and second detector means having differing characteristics, corrector means operatively associated with said drive means and selectively actuable in the alternative to first and second conditions of operation, respectively, to increase and decrease the speed of said drive means, discriminator means arranged to receive said signals and to actuate said corrector means to one of said conditions of operation alternatively responsive to the characteristics of the first received of said signals.

2. A web feeding apparatus having drive means for advancing a web at a selected rate of movement, processing means cyclically shifted into engagement with said web and processing means including other means arranged to emit a signal at a predetermined point in the operating cycle of said processing means, detector means in leading position of said processing means arranged to emit a signal distinguishable from said first named signal responsive to the passage of trigger indicia carried by said web, first and second clutch means, each having driven elements operatively connected to said drive means and normally disengaged driver elements, constantly driven motor means operably associated with said driver elements, and arranged upon engagement of each of said clutches to apply a speed

correction to said drive means, the correction applied by engagement of the elements of said first clutch being in a sense opposite to the correction applied by engagement of the elements of said second clutch, discriminator means arranged to receive and distinguish between said signals and to effect the engagement of the elements of one or the other of said clutch members in the alternative selectively responsive to the order in which said signals are received and to maintain said elements in engagement for a period which is a function of the period of separation of said signals.

3. A web feeding apparatus having drive means for drawing a web in a linear direction, first and second detector means in predetermined spaced relation along the path of movement of said web, one said detector means, upon actuation, emitting signals of opposite polarity to the signal emitted upon actuation of said other detector means, constantly energized speed correction means normally disassociated from said drive means, first and second clutch means, each operatively associated with said drive means and said speed correction means, said first and second clutch members, upon actuation, providing respectively an advancing and a retarding connection between said speed correction means and said drive means, and clutch actuator means including a gate circuit operatively associated with said detector means and said clutch members selectively to actuate one of said clutch members responsive to the order of impression of said signals from said detector means and to maintain said one clutch member in said actuated condition until a signal of opposite polarity to said first impressed signal is impressed upon said gate circuit.

4. A web feeding apparatus having drive means for drawing a web in a linear direction at a selected rate of speed, first and second detector means in linear spaced relation along the path of movement of said web, said detector means being arranged to detect errors in either sense from said selected rate of speed and to emit signals of opposite polarity, the order of emission of said signals being in one sequence when said web lags and in opposite sequence when said web leads said selected rate, corrector means including first and second clutches arranged selectively and alternatively to be linked to said drive means in a manner to apply corrections of opposite sense thereto, and discriminator means arranged to receive said signals and to actuate one or the other of said clutches in the alternative selectively in accordance with the polarity of the first received of said signals and to deactivate said activated clutch upon receipt of a signal of opposite polarity to said first received signal, and first and second normally closed switch means in the circuits of said first and second clutches, respectively, said switch means of the non-activated clutch being opened responsive to said first

impressed signal, and closed responsive to the second signal impressed on said discriminator.

5. A device in accordance with claim 2 wherein said signals are of opposite polarity and are arranged to be contemporaneously emitted when said web is travelling at said selected rate of speed.

6. A web feeding apparatus in accordance with claim 3 wherein said gate circuit includes first and second normally closed switch means in series with said first and second clutches, respectively, and said first impressed signal is effective to open said switch of the clutch not actuated by said first impressed signal.

7. A web feeding apparatus in accordance with claim 6 wherein said second impressed signal is effective to close the switch opened by said first impressed signal and to deactivate the clutch activated by said first impressed signal.

8. In a web feed apparatus having drive means for drawing a web at a selected rate of movement, and having web modifying means cyclically shifted into operative relation with the web and corrector means associable with said drive means selectively to advance the position of said web and to retard the position of said web, control means for said corrector means comprising a first detector adapted to emit a signal having a first characteristic when the modifying means is in predetermined position with respect to the web, second detector means arranged to emit a signal having a second characteristic distinguishable from said first characteristic when predetermined portions of said web pass a detecting station, and discriminator means arranged to receive said signals and to associate said corrector means and said drive means in one of said positions selectively in response to the characteristic of said first received signal and to dissociate said corrector mean and drive means upon receipt of the second received signal.

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