April 16, 1935. R. S. CLARK 1,998,271

PAPER FEEDING APPARATUS

Filed March 12, 1930 3 Sheets-Sheet 1

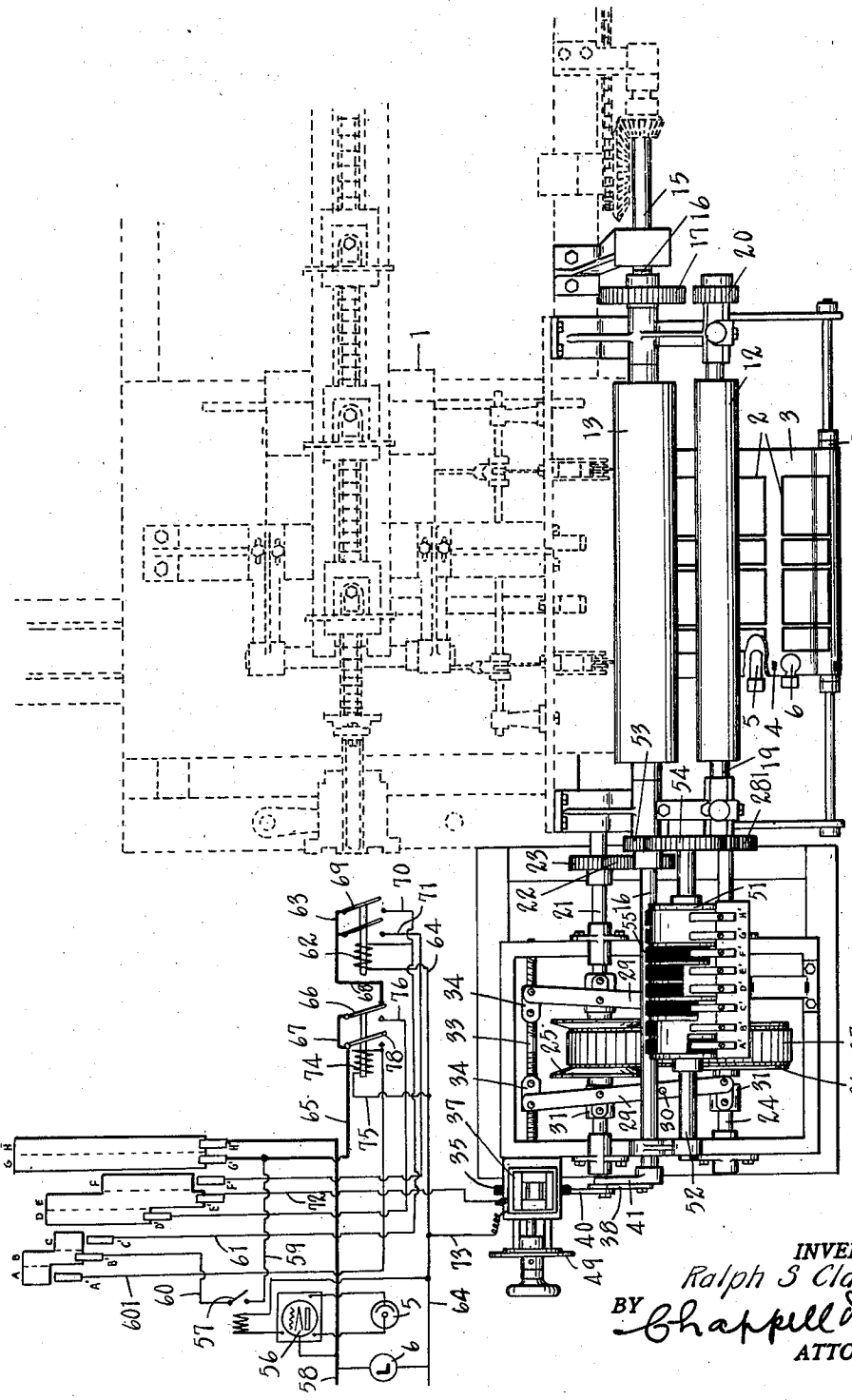


Fig. 1

INVENTOR
Ralph S Clark
BY Chappell & Earl
ATTORNEYS

April 16, 1935. R. S. CLARK 1,998,271

PAPER FEEDING APPARATUS

Filed March 12, 1930 3 Sheets-Sheet 2

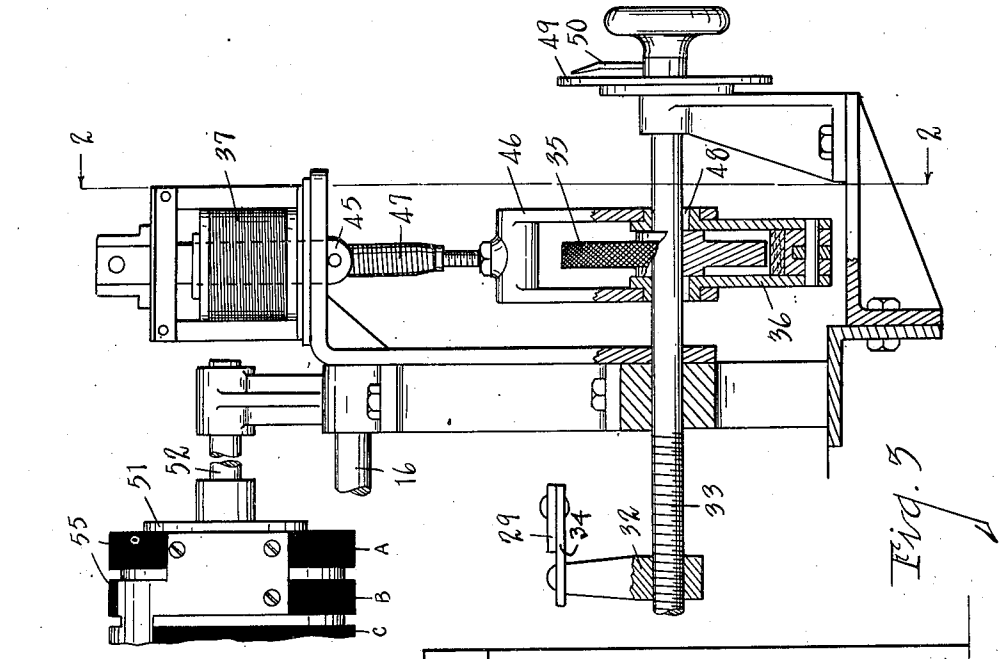


Fig. 3

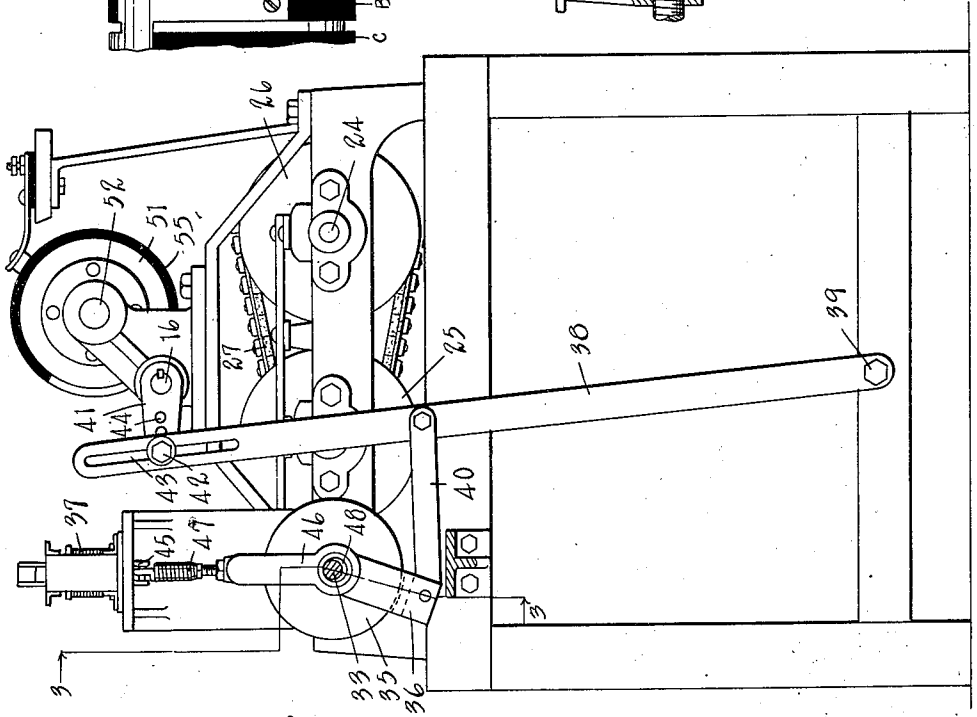


Fig. 2

INVENTOR
Ralph S. Clark
BY Chappell & Earl
ATTORNEYS

April 16, 1935. R. S. CLARK 1,998,271

PAPER FEEDING APPARATUS

Filed March 12, 1930 3 Sheets-Sheet 3

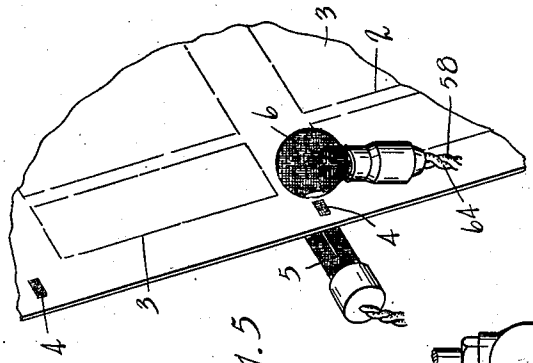


Fig. 5

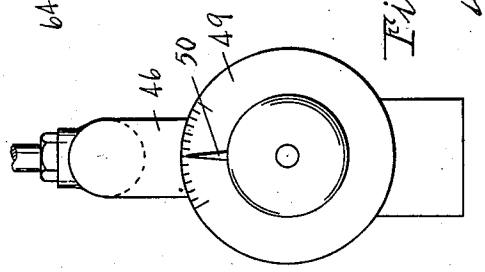


Fig. 6

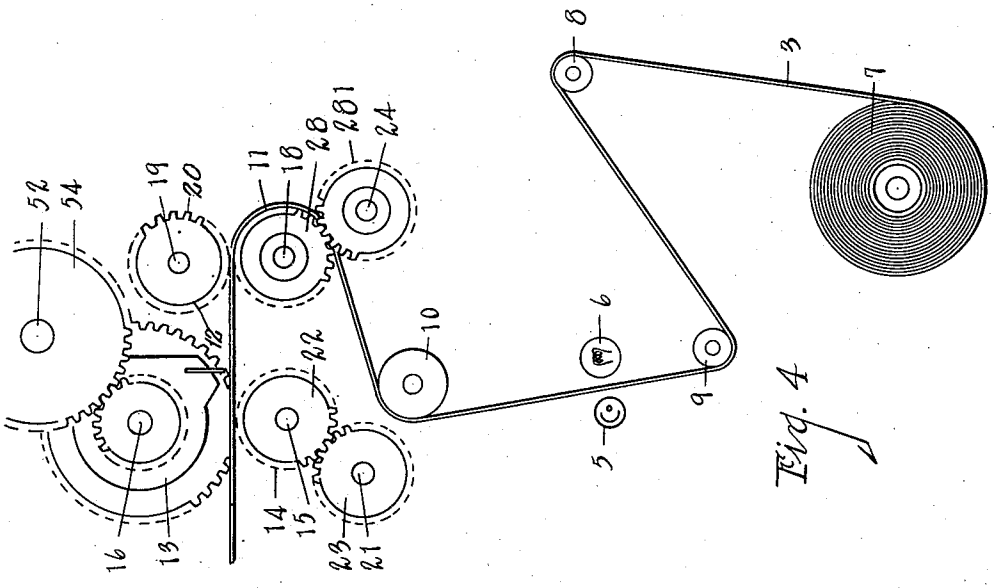


Fig. 4

INVENTOR
Ralph S. Clark
BY Chappell & Earl
ATTORNEYS

Patented Apr. 16, 1935 1,998,271

UNITED STATES PATENT OFFICE

1,998,271

PAPER FEEDING APPARATUS

Ralph S. Clark, Kalamazoo, Mich., assignor to Kalamazoo Vegetable Parchment Company, Kalamazoo, Mich.

Application March 12, 1930, Serial No. 435,143

28 Claims. (Cl. 164—68)

In the accompanying drawings, I have illustrated my improved paper feeding apparatus as adapted and embodied by me in a carton wrapping machine. I desire to point out, however, that my improvements are desirable and readily adapted to machines for cutting webs of paper into sheets, the device providing an automatic control whereby very great accuracy results.

The main objects of this invention are:

First, to provide for cutting a web of paper into sheets by an apparatus which is automatic in its operation and of very large capacity.

Second, to provide an apparatus for cutting a web of paper having a series of designs thereon into sheets of uniform dimensions suitable for the wrapping of cartons.

Third, to provide a machine having these advantages which may be readily applied to or embodied in a carton wrapping machine.

Objects relating to details and economies of my invention will appear from the description to follow. The invention is defined and pointed out in the claims.

A structure which is a preferred embodiment of my invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a fragmentary plan view of my sheet cutting apparatus as applied to a carton wrapping machine, the machine proper being shown in dotted lines, certain portions of the electrical apparatus being shown diagrammatically and conventionally, certain parts that are shown diagrammatically, namely, the control switch, being also shown as actually embodied in the machine.

Fig. 2 is an end elevation partially in vertical section on line 2—2 of Fig. 3.

Fig. 3 is a fragmentary view partially in section on line 3—3 of Fig. 2.

Fig. 4 is a diagrammatic view showing the paper feed, the photo-electric cell and cutting means and the relation of the web of paper thereto.

Fig. 5 is an enlarged fragmentary perspective view showing the relation of the photo-electric cell to the web of paper, and the spots provided on the web of paper for controlling the apparatus.

Fig. 6 is a fragmentary elevation of parts of the control member.

As stated, the structure illustrated discloses an adaptation of my improvements to a carton wrapping machine which is designated generally by the numeral 1. The details of this are not illustrated as they form no part of my present invention, it being sufficient, it is believed, to point out that in wrapping cartons with wrappers having designs or printed matter thereon, (and by the terms "designs," when later used, I include printed matter), they must be located in a definite relation to the carton. These designs are indicated at 2 on the web of paper 3, the designs being in a uniformly spaced series on the web.

The web also has a uniformly spaced series of spots 4 printed thereon in definitely associated relation to the designs, the designs being spaced from an edge of the web of paper and the spots being positioned in this space between the design and the edge of paper so that as the web travels along, the spots are successively brought into operative relation to the photo-electric cell 5, a lamp 6 being disposed on the opposite side of the web so that the spots pass between the lamp and the photo-electric cell.

As pointed out, the apparatus is adapted for cutting a web of paper into sheets for other purposes than delivery to a wrapping machine and in that case, it is merely a matter of spacing the spots as may be desired.

The web of paper is passed from the roller 7 over the tension and guide rollers 8 and 9 to the roller 10 from whence it is passed between the feed rollers 11 and 12 by which the paper is delivered to the rotary cutters 13 and 14. The shaft 15 on which the cutter 14 is mounted is the driving shaft of the paper feed apparatus and is synchronized with the wrapping mechanism, the driving connections to the wrapping mechanism however not being shown herein.

As the delivery of paper to the cutter determines the points at which the paper is severed, it is necessary to deliver the web of paper so that the severing is at the proper point in relation to the designs and to compensate for slippage and other variations, I provide a variable speed driving connection from the driving shaft 15, which is connected to the shaft 16 of the cutter 13 by means of gearing indicated at 17, Fig. 1, to the shaft 18 of the feed roller 11. This shaft is connected to the shaft 19 of the feed roller 12 by means of gearing indicated at 20.

The variable speed driving connection consists of the transmission shaft 21 which is connected to the shaft 15 by means of the gears 22 and 23. This shaft 21 is connected to the shaft 24 by the pulleys 25 and 26, respectively, on these shafts and the coacting belt 27. These pulleys are expansion pulleys, the increasing and decreasing of their diameter uniformly varying the speed. The shaft 24 is connected to the feed roller shaft 18 by means of the gears 28 and 281 respectively.

By this means, while the shaft 15 is driven at

a constant speed, the speed of the feed rollers may be very considerably varied and thus the delivery of the paper to the cutter is controlled, this control mechanism being in turn controlled by means including the photo-electric cell 5 which, as stated, is so disposed as to be subject to the influence of the spots on the web of paper as they are successively advanced by the feed rollers.

In connection with Fig. 1, I have shown the control apparatus in diagrammatic form, parts such as the photo-electric cell, the light and the timing switch mechanism being illustrated in their relation to the machine and also in the diagram.

The pulleys 25 and 26 are expanded and contracted by means of the levers 29 which are pivoted at 30 intermediate the shafts 21 and 24, the levers being connected to the pulley expanding members 31 of each pulley. These levers are connected to nuts 32 on the reversely threaded screw 33 by means of the links 34 so that when the shaft is rotated the one pulley is expanded as the other is contracted.

The screw is provided with a clutch disk 35 with which the oscillating clutch 36 coacts, this clutch being shifted to engaging position by means of the solenoid 37.

The clutch has a driving connection to the driving shaft 16, this connection consisting of the rocker arm 38 pivoted at 39 and connected by the link 40 to the clutch member. The shaft 16 has a crank 41 thereon whose pin 42 engages the longitudinal slot 43 in the rocker arm, each stroke resulting in a full oscillation of the clutch member, the direction of rotation, however, of the clutch disk depending on the timing of the engagement of the clutch. The amount of throw of the clutch may be varied by changing the position of the crank pin on the crank arm, the crank arm being provided with a plurality of holes 44 with which the crank pin may be selectively engaged.

It will be observed that the clutch member 36 is connected to the armature 45 of the solenoid 37 by means of the yoke-like link 46 and the spring 47, the clutch having a loose engagement at 48 with the screw 33—see Fig. 3.

An indicating dial 49 is provided to coact with the pointer 50 on the screw 33—see Figs. 3 and 6. This however is a matter of convenience in determining whether the machine is functioning as desired.

When the clutch is engaged but returns to neutral at the end of the adjusting stroke, the engagement of the clutch is controlled by the switch drum 51 which has contact segments ABC, DEF and GH, the segment B in effect being a connecting segment for the contacts A and C, E being a connecting segment for the contacts D and F. Brushes A', B' and C' coact with the segments ABC respectively; contacts of the brushes D', E' and F' coact with the segments DEF respectively, while contacts G', H' contact with the segments G and H.

The segment drum 51 is mounted on a shaft 52 connected by the gears 53 and 54 to the shaft 15 so that the drum is driven at a constant speed. The segments are insulated from the drum by the insulating rings 55.

It should be observed that the segments A and C are in non-overlapping relation so that when the switch drum is in the position shown in Fig. 1 which is the position it should occupy normally when a spot 5 registers with the photo-electric cell, no action in the adjusting mechanism takes place, although of course the impulse imparted through the amplifier or pliotron 56 will actuate the relay switch 57.

I desire also to point out that while for operating convenience a mark or spot 4 is placed in definitely associated relation with each design, it is not necessary or perhaps desirable to allow the machine to correct on every sheet cut. The machine illustrated is designed to correct on every second sheet.

In order to provide correction on every second sheet, the shaft 52 is geared to the shaft 16 so that it is driven at one-half the speed thereof. For example, when no corrective action is necessary; that is, when the paper is being delivered to the cutter in proper relation so that it is severed at the right point, a spot 4 passing the photo-electric cell 5 results in an electric impulse closing the relay 57. A secondary current flows from the current source wire 58 to the brush H' to the connected segments G and H and back through the brush or contact G' and through the wire 59 of relay switch 57 to the wire 60 and through the brush B' to the segments ABC. Inasmuch as the A and C segments are placed so that there is a gap or neutral space between them, when the impulse comes at the correct time it will not be able to flow to either the A or C segments and no adjusting action takes place. It will be seen that when the next cell impulse occurs that the switch drum will have revolved 180° and the A, B and C segments are all open; that is, the brushes are contacting with the insulation and the second impulse therefore cannot complete beyond the relay switch.

To make the correction for paper coming too slowly in which case the photo-electric cell gives its electrical impulse after the switch drum has passed the neutral point between the A and C segments, the secondary current flows from 58 to the ABC segments as before described. However, the current can now pass through the C segment to the position C', passing into the wire 61 to the coil 62 of the relay 63 and on into the wire 64 which is the other side of the power line or source of electrical supply, thus completing the circuit. As soon as this relay 63 closes, the current can also pass from 58 through the brushes H', connected segments HG and the brush G' to the wire 65 and through contact 66 of relay 67 to wire 68 and through relay contacts 69 to the wire 70 to coil 62 thence to the circuit wire 64 which action seals in the relay.

The closing of the relay 63 also puts current from wire 58 into wire 71 leading to contact brush F', and after segments DEF have traveled through an arc of 90° it contacts with brush F' allowing current to flow into the segments DEF and leave through the brush E' to wire 72 which leads to the solenoid 37, passing through the solenoid through the wire 73 to the circuit wire 64.

Referring to Fig. 2, it will be noted that the crank arm 41 is in correct position for the solenoid 37 to be energized. The solenoid remains energized while the crank makes a complete cycle when the segment F on the drum switch breaks connection and the solenoid is de-energized. This action moves the screw 33 in a counter clockwise direction and returns it to its original position. While this movement is taking place, it changes the speed ratio between the cutter and the feed rollers, speeding up the paper.

It should be remembered that in this mechanism shown, the switch drum is rotating at one-

half the speed of the cutter and the crank so that the contact F' continues through an arc of 180°. The relay 63 has been held in circuit during this period through the segments GH and their respective brushes which now open, releasing the contacts of the relay 63 which are now ready for another impulse.

To make correction for paper coming too fast or in which the spots on the web reach the photo-electric cell too early in the cycle of operation, the spot imparts the impulse to the photo-electric cell before the switch drum has passed from the neutral point of the segments A and C. The current can now pass from circuit wire 58 through H', HG, G', through the wires 59 and 60 to B' and through segments AB to brush A' and on through 601 to coil 74 of relay 67 and through this coil to circuit wire 64 completing the circuit and closing this relay. As soon as the relay 67 closes, it is also sealed in by a current passing from circuit 58 through H', GH, G' through wire 65 to relay coil 74 through wire 75 to the circuit wire 64, thus completing the circuit. The current from 58 can also flow through the wire 76 to the contact brush D' to the segments DE to the contact brush E' through wire 72 to the coil of the solenoid 37 and on to circuit wire 64, again completing the solenoid energizing circuit. The segments DE are so located that the solenoid is energized as soon as the AC segment neutral point is reached. The crank is, however, on the opposite side of its stroke from that shown in Fig. 2. The clutch being engaged by the solenoid remains engaged by the crank, making a complete revolution. The control shaft is now moved clockwise through an arc and returned to its original position. While this takes place, it changes the driving ratio of the variable speed device, slowing down the paper.

At the completion of revolution of the crank arm, the brush passes from segment D and the current is broken, thus de-energizing the solenoid. Further rotation of the switch drum opens the segments G and H which breaks the current in relay 67, the relay returning to its normal open position.

To prevent both relays 63 and 67 closing on account of the neutral gap between A and C being quite short, I provide an extra relay contact 78. Should both relays be energized at the same time, the relay 67 will seal in but relay 63 cannot seal in because of the break in circuit of contact 66.

I have illustrated and described my improvements as embodied in a carton wrapping machine. I have not attempted to illustrate other modifications or adaptations thereof as it is believed that this disclosure will enable those skilled in the art to which my invention relates to embody or adapt the same as may be desired.

The apparatus is very accurate and entirely automatic in operation and may be readily embodied in machines now in quite extensive use as well as incorporated in new machines.

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

1. In an apparatus for cutting into sheets a web of paper having a longitudinal series of spots thereon, the combination of driving and driven shafts, a rotary cutter on one of said shafts and a feed roller on the other, a driving connection for said shafts including a transmission shaft geared to the driving shaft, expansible pulleys on said transmission and driven shafts, a belt coacting with said pulleys, means for contracting and expanding said pulleys including a pair of levers, a reversely threaded actuating screw for said levers, a clutch disk on said screw, an oscillating clutch member coacting with said disk, a solenoid for engaging said clutch member with said disk, a crank on said driving shaft, a rocker arm having a longitudinal slot engaged by said crank, a link connecting said rocker arm to said clutch member, relays for controlling said clutch actuating solenoid, a driven switch member having driving connection to said shaft for controlling said relays, a photo-electric cell operatively associated with the web of paper so that the spots thereon are successively passed across said cell as the web is advanced, and a control relay operatively associated with said photo-electric cell, switch member and clutch controlling relays.

2. In an apparatus for cutting into sheets a web of paper having a longitudinal series of spots thereon, the combination of driving and driven shafts, a rotary cutter on one of said shafts and a feed roller on the other, a driving connection for said shafts including a transmission shaft geared to the driving shaft, expansible pulleys on said transmission and driven shafts, a belt coacting with said pulleys, means for contracting and expanding said pulleys including a pair of levers, a reversely threaded actuating screw for said levers, a clutch disk on said screw, an oscillating clutch member coacting with said disk, a solenoid for engaging said clutch member with said disk, a crank on said driving shaft, a rocker arm having a longitudinal slot engaged by said crank, a link connecting said rocker arm to said clutch member, and means for controlling said solenoid including a photo-electric cell operatively associated with said web of paper.

3. In an apparatus for cutting paper, the combination of driving and driven shafts, a cutter operatively associated with one of said shafts and a feed means operatively associated with the other shaft, a variable speed driving connection for said shafts, means for adjusting said variable speed means comprising a screw, a clutch disk on said screw, an oscillating clutch member coacting with said disk, a solenoid for engaging said clutch member with the clutch disk, a crank on said driving shaft, a rocker arm having a longitudinal slot engaged by said crank, a link connecting said rocker arm to said clutch member, relays for controlling said clutch actuating solenoid, a driven switch member having driving connection to said shaft for controlling said relays, a photo-electric cell operatively associated with the paper to be actuated by predetermined parts thereof, and a control relay operatively associated with said photo-electric cell, switch member and clutch controlling relays.

4. In an apparatus for cutting paper, the combination of driving and driven shafts, a cutter operatively associated with one of said shafts and a feed means operatively associated with the other shaft, a variable speed driving connection for said shafts, means for adjusting said variable speed means comprising a screw, a clutch disk on said screw, an oscillating clutch member coacting with said disk, a solenoid for engaging said clutch member with the clutch disk, a crank on said driving shaft, a rocker arm having a longitudinal slot engaged by said crank, a link connecting said rocker arm to said clutch member, and means for controlling said solenoid including

a photo-electric cell operatively associated with the paper.

5. In an apparatus for cutting paper, the combination of paper feed means, a cutter to which said paper feed means delivers, a variable speed driving connection for said paper feed means and cutter, means for adjusting said variable speed driving connection including a screw, a clutch disk on said screw, a crank driven at a uniform speed, a rocker arm having a longitudinal slot engaged by said crank, an oscillating clutch member coacting with said clutch disk, a solenoid for engaging said clutch member with said disk, a link connecting said clutch member to said rocker arm, relays for controlling said clutch actuating solenoid, a switch member driven at a uniform speed for controlling said relays, a photo-electric cell operatively associated with the paper to be actuated by predetermined parts thereof, and a control relay operatively associated with said photo-electric cell, said switch member and said clutch control relays.

6. In an apparatus for cutting paper, the combination of paper feed means, a cutter to which said paper feed means delivers, a variable speed driving connection for said paper feed means and cutter, means for adjusting said variable speed driving connection including a screw, a clutch disk on said screw, a crank driven at a uniform speed, a rocker arm having a longitudinal slot engaged by said crank, an oscillating clutch member coacting with said clutch disk, a solenoid for engaging said clutch member with said disk, a link connecting said clutch member to said rocker arm, and means for controlling said solenoid including an electrical impulse member associated with the paper to be actuated by predetermined parts thereof.

7. In an apparatus for cutting paper, the combination of paper feed means, a cutter operatively associated therewith, a variable speed driving connection for said paper feed means and cutter, means for adjusting said variable speed driving connection including a magnetic clutch having an oscillating driven member, an electric control element operatively associated with the paper, relays for controlling said clutch, a switch member driven at uniform speed for controlling said relays, a photo-electric cell operatively associated with the paper to be actuated by predetermined parts thereof, and a control relay operatively associated with said photo-electric cell, said switch member and said clutch control relays.

8. In an apparatus for cutting paper, the combination of paper feed means for advancing the paper with an uninterrupted continuous movement, a cutter operatively associated therewith, a variable speed driving connection for said paper feed means and cutter, means for adjusting said variable speed driving connection to change the speed of said feed means including a magnetic clutch having an oscillating driven member, and means for controlling said magnetic clutch including a photo-electric cell operatively associated with the paper.

9. In an apparatus for cutting paper, the combination of paper feed means for continuously advancing the paper without interruption, a cutter operatively associated therewith, a variable speed driving connection for said paper feed means and cutter, means for adjusting said variable speed driving connection to change the speed ratio between said feed means and said cutter, including a magnetic clutch having an oscillating driven member, an electric control element operatively associated with the paper, and means for controlling said magnetic clutch interposed between said control element and said clutch and including a driven switch member.

10. In an apparatus for cutting paper, the combination of paper feed means for continuously advancing the paper without interruption, a cutter operatively associated therewith, a variable speed driving connection for said paper feed means and cutter, means for adjusting said variable speed driving connection to change the speed ratio between said feed means and said cutter, including a magnetic clutch having an oscillating driven member, an electric control element operatively associated with the paper, and means for controlling said magnetic clutch interposed between said control element and said clutch.

11. In an apparatus for cutting into sheets a web of paper having a longitudinal series of spaced electric element actuators, the combination of a paper feed means, a paper cutter operatively associated with said paper feed means, a variable speed driving connection for said paper feed means and cutter, and a unitary organization comprising a moving element having the double property when engaged of operating said variable speed driving connection to increase or decrease the feed means-cutter speed ratio and return the parts to normal, a clutch for engaging said moving element, and a solenoid controlled by said electric element actuators for operating said clutch to engage the moving element.

12. In an apparatus for cutting a web of paper into sheets, the combination of a paper feed means, a paper cutter operatively associated with said paper feed means, a variable speed driving connection for said paper feed means and cutter, and means activated by predetermined portions of said web of paper for automatically adjusting said variable speed driving means for increasing or diminishing the feeding speed and returning this to its normal ratio to the cutting speed on each adjusting cycle, said last named means comprising a unitary organization including a moving element having the double property when engaged of increasing or decreasing the speed ratio and bringing the parts to normal, a clutch for engaging said moving element, and a web controlled solenoid for operating said clutch to engage the moving element.

13. In an apparatus for cutting into sheets a web having a longitudinal series of indicia, the combination of driving and driven shafts, a rotary cutter on one of said shafts and a feed roller on the other, a driving connection for said shafts including a transmission shaft geared to the driving shaft, expansible pulleys on said transmission and driven shafts, a belt coacting with said pulleys, means for contracting and expanding said pulleys including a pair of levers, a reversely threaded actuating screw for said levers, a clutch disk on said screw, an oscillating clutch member coacting with said disk, a solenoid for engaging said clutch member with said disk, a crank on said driving shaft, a rocker arm having a longitudinal slot engaged by said crank, a link connecting said rocker arm to said clutch member, relays for controlling said clutch actuating solenoid, a driven switch member having driving connection to said shaft for controlling said relays, sensing means operatively associated with the web so that the indicia thereon are successively passed across said means as the web is advanced, and a control relay operatively asso-

ciated with said means, switch member and clutch controlling relays.

14. In an apparatus for cutting into sheets a web having a longitudinal series of indicia, the combination of driving and driven shafts, a rotary cutter on one of said shafts and a feed roller on the other, a driving connection for said shafts including a transmission shaft geared to the driving shaft, expansible pulleys on said transmission and driven shafts, a belt coacting with said pulleys, means for contracting and expanding said pulleys including a pair of levers, a reversely threaded actuating screw for said levers, a clutch disk on said screw, an oscillating clutch member coacting with said disk, a solenoid for engaging said clutch member with said disk, a crank on said driving shaft, a rocker arm having a longitudinal slot engaged by said crank, a link connecting said rocker arm to said clutch member, and means for controlling said solenoid including sensing means operatively associated with said web.

15. In an apparatus for cutting a web, the combination of driving and driven shafts, a cutter operatively associated with one of said shafts and a feed means operatively associated with the other shaft, a variable speed driving connection for said shafts, means for adjusting said variable speed means comprising a screw, a clutch disk on said screw, an oscillating clutch member coacting with said disk, a solenoid for engaging said clutch member, a crank on said driving shaft, a rocker arm having a longitudinal slot engaged by said crank, a link connecting said rocker arm to said clutch member, relays for controlling said clutch actuating solenoid, a driven switch member having driving connection to said shaft for controlling said relays, sensing means operatively associated with the web to be actuated by predetermined parts thereof, and a control relay operatively associated with said sensing means, switch member and clutch controlling relays.

16. In an apparatus for cutting a web, the combination of driving and driven shafts, a cutter operatively associated with one of said shafts and a feed means operatively associated with the other shaft, a variable speed driving connection for said shafts, means for adjusting said variable speed means comprising a screw, a clutch disk on said screw, an oscillating clutch member coacting with said disk, a solenoid for engaging said clutch member, a crank on said driving shaft, a rocker arm having a longitudinal slot engaged by said crank, a link connecting said rocker arm to said clutch member, and means for controlling said solenoid including sensing means operatively associated with the web.

17. In an apparatus for cutting a web, the combination of web feed means for continuously advancing the web without interruption, a cutter operatively associated therewith, a variable speed driving connection for said feed means and cutter, means for adjusting said variable speed driving connection to change the speed ratio between said feed means and said cutter, including a magnetic clutch having an oscillating driven member, an electric control element operatively associated with the web, and means for controlling said magnetic clutch interposed between said control element and said clutch.

18. In an apparatus for cutting a web, the combination with a cutter, of a web feeding means for uninterruptedly advancing the web to be cut to the cutter, a variable speed driving connection for said web feeding means and cutter, means for adjusting said variable speed driving connection including a driven member traveling on each actuation thereof through a full stroke or cycle, an electrically controlled clutch for connecting said variable speed adjusting means to said driven member at any position in its stroke or cycle, and means for controlling said electrically controlled clutch including a sensing means operatively associated with the web.

19. A feed means for a web having a longitudinal series of spaced electric element actuators including a variable speed driving means, means for regulating said variable speed driving means to vary the speed thereof including a driven member traveling on each actuation thereof through a full stroke or cycle, an electrically controlled clutch for connecting said variable speed regulating means to said driven member at any position in its stroke or cycle, and means for controlling said electrically controlled clutch including a sensing means operatively associated with the web in advance of said feed means so that it is subject to the influence of said actuators.

20. In an apparatus for cutting a web, the combination with a cutter, a web feeding means for continuously advancing a web to be cut to said cutter, a variable speed driving connection for said feeding means and cutter, means for controlling said driving connection to vary the speed thereof including an adjusting screw having a clutch disk thereon, an oscillating clutch member operatively associated with said disk, and electrically controlled means for causing said oscillating clutch member to drive said disk, operable at any point in its stroke and including a sensing means operatively associated with the web.

21. In an apparatus for cutting a web, the combination with a cutter, a web feeding means for continuously advancing a web to be cut to said cutter, a variable speed driving connection for said feeding means and cutter, means for controlling said driving connection to vary the speed thereof including an oscillating driving clutch member, a rotatable driven clutch member, and electrically controlled means for causing said driving clutch member to drive said driven clutch member, operable at any point in its stroke and including a sensing means operatively associated with the web.

22. In an apparatus for cutting a web having a longitudinal series of spaced electric element actuators, the combination of a cutter, feed means for uninterruptedly advancing the web to the cutter, a variable speed driving connection for said feed means and cutter, and means for increasing or diminishing the feeding speed and returning this to its normal ratio to the cutting speed on each adjusting cycle, said means including in a unitary organization a web controlled solenoid, a solenoid controlled clutch, and a moving element having the double property of increasing or decreasing the feed means-cutter speed ratio and bringing the parts back to normal when said clutch is thrown by said solenoid to engage said moving element.

23. In an apparatus for cutting a web, the combination of a cutter, feed means for uninterruptedly advancing the web to the cutter, a variable speed driving connection for said feed means and cutter, and means for increasing or diminishing the feeding speed and returning this to its normal ratio to the cutting speed on each adjusting cycle including in a unitary organization a web controlled solenoid, a solenoid

controlled clutch, and a moving element having the double property of increasing or decreasing the feed means-cutter speed ratio and bringing the parts back to normal when said clutch is thrown by said solenoid to engage said moving element.

24. In a web handling apparatus of the character set forth, the combination with web feed means, and a web cutter, of a variable speed driving connection between said feed means and cutter, and a unitary organization comprising a moving element having the double property when engaged of operating said variable speed driving connection to increase or decrease the feed means-cutter speed ratio and return the parts to normal, a clutch for engaging said moving element, and a web controlled solenoid for throwing said clutch to engage the moving element.

25. In a web handling apparatus of the character set forth, the combination with web feeding and cutting means, of a normally constant variable speed driving connection between said means, a constantly moving reciprocating element, a normally open clutch for connecting said element to said connection, and a web controlled solenoid for closing said clutch and holding the same closed until said element operates said connection to increase or decrease the feeding-cutting speed ratio and return the parts to normal.

26. In a web handling apparatus of the character set forth, the combination with web feeding and cutting means having a variable speed ratio for controlling the length of the sheets cut from the web, of a web controlled solenoid, a solenoid controlled clutch, and a moving element in a unitary organization having the double property of increasing or decreasing said speed ratio and bringing the parts to normal on the throwing of said clutch by said solenoid to engage said moving element.

27. In a web handling apparatus of the character set forth, the combination with web feeding and cutting means, of means responsive to indicia on said web, a clutch controlled by said means, and a moving element having the double property of increasing or decreasing the feeding-cutting speed ratio and bringing the parts to normal on the operation of said clutch by said web indicia responsive means to engage said moving element.

28. In a web handling apparatus of the character set forth, the combination with web feeding and cutting means, of web controlled means including a clutch and a moving element having the double property of changing the web feeding-cutting speed ratio and returning the parts to normal on the engagement of said clutch with said moving element.

RALPH S. CLARK.