May 31, 1932. C. F. RICHARD 1,860,691

PAPER FEEDING AND CUTTING MECHANISM

Filed Feb. 5, 1930 3 Sheets-Sheet 1

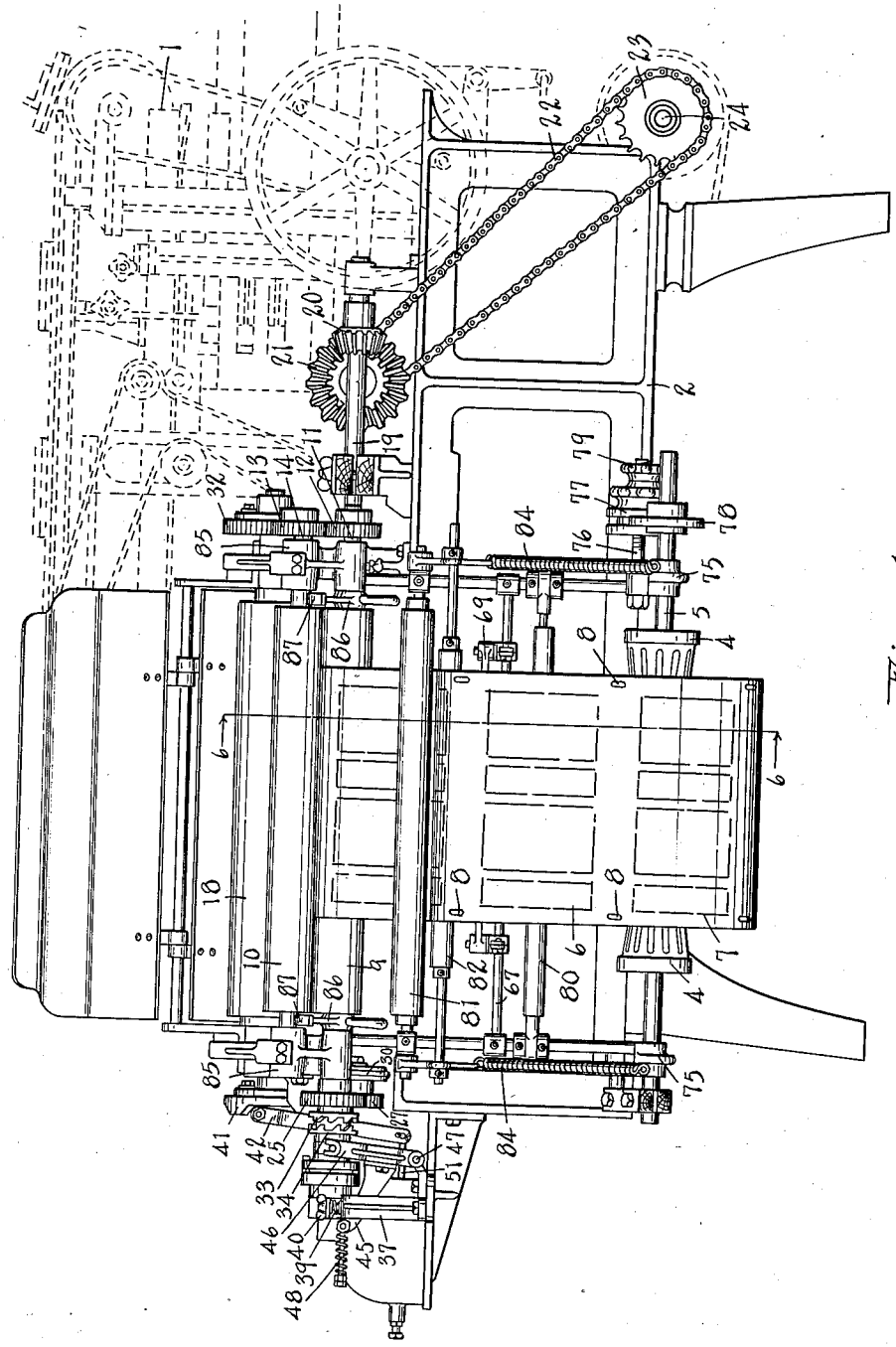


Fig. 1

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PAPER FEEDING AND CUTTING MECHANISM

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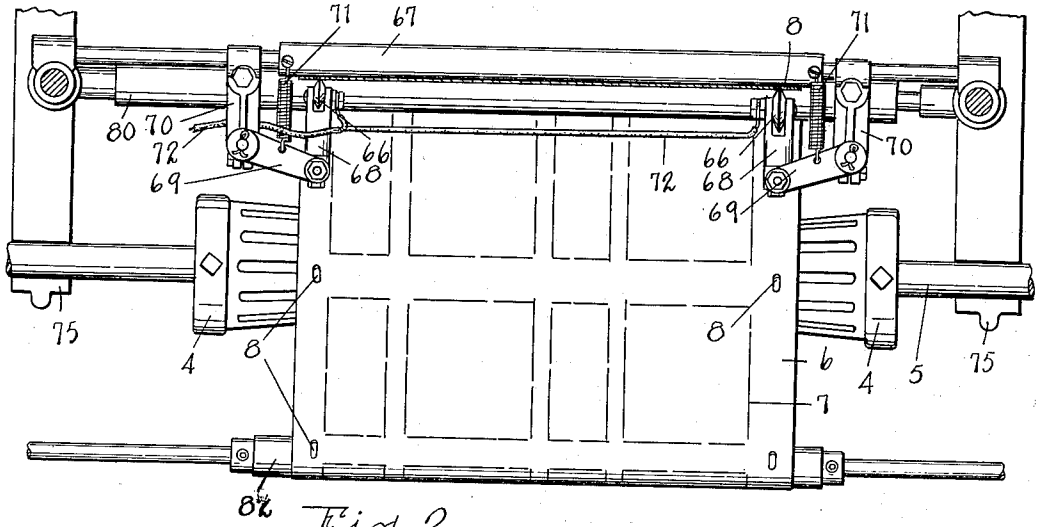


Fig. 2

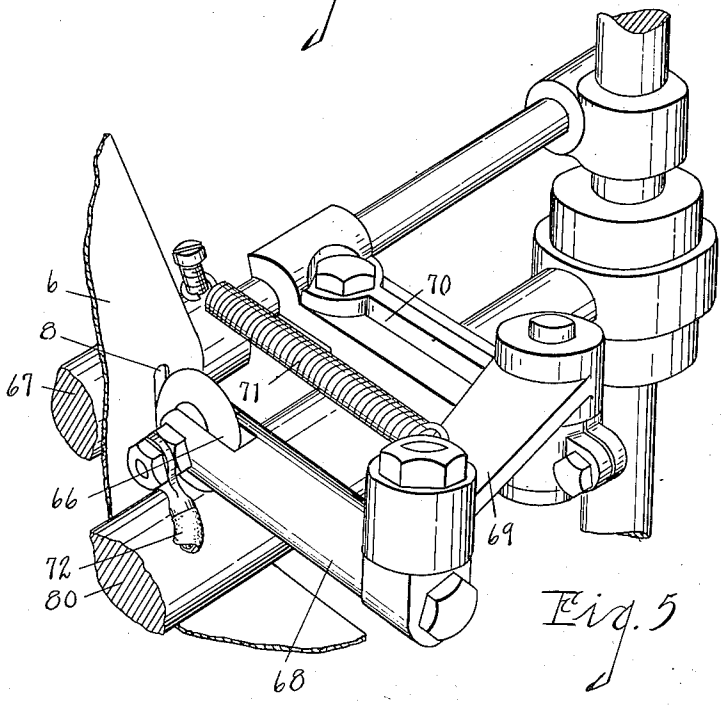


Fig. 5

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PAPER FEEDING AND CUTTING MECHANISM

Filed Feb. 5, 1930 3 Sheets-Sheet 3

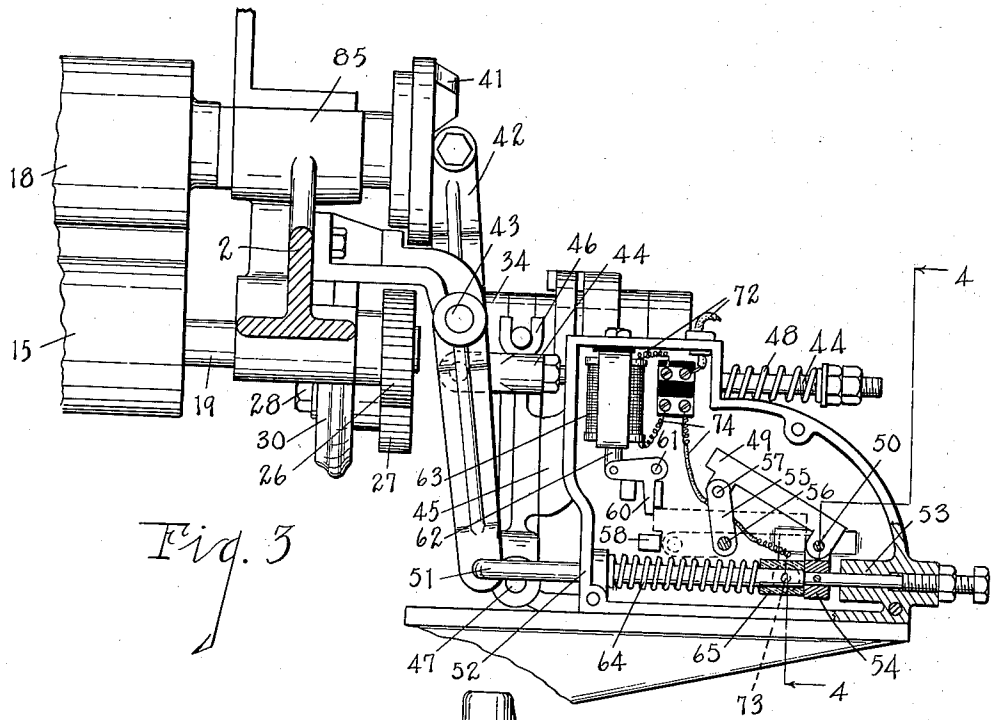


Fig. 3

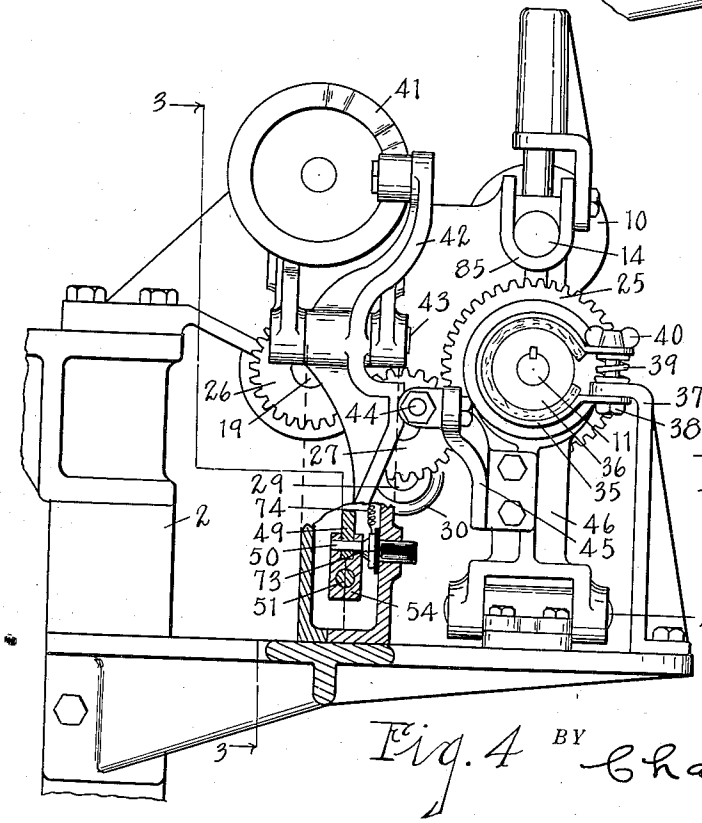


Fig. 4

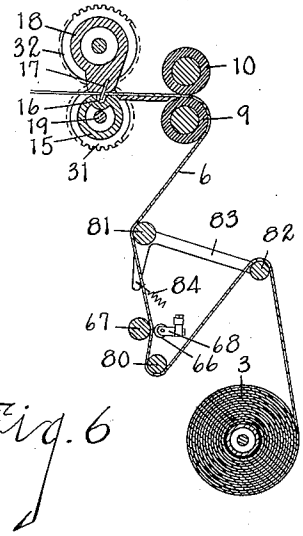


Fig. 6

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Patented May 31, 1932 1,860,691

UNITED STATES PATENT OFFICE

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PAPER FEEDING AND CUTTING MECHANISM

Application filed February 5, 1930. Serial No. 426,018.

In order to secure a neat appearance in the wrapping of articles in packages with printed wrappers, it is necessary to accurately present or register the wrapper with the package.

The main object of this invention is to provide a paper feed mechanism by means of which the wrappers are accurately fed from a roll of paper and cut off in proper relation to the design appearing on the wrappers.

A further object is to provide a machine having these advantages which is entirely automatic in operation.

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

A structure which embodies the features of my invention is clearly illustrated in the accompanying drawings, in which:

Fig. 1 is a fragmentary side elevation of a wrapping machine embodying the features of my invention.

Fig. 2 is a fragmentary plan view with certain parts in section showing details of the contact means of the electrically controlled paper feed means.

Fig. 3 is a fragmentary side elevation partially in vertical section on line 3—3 of Fig. 4 showing further details of the electric control mechanism.

Fig. 4 is a detail view partially in section on line 4—4 of Fig. 3.

Fig. 5 is an enlarged fragmentary perspective view of certain parts of the electric control mechanism.

Fig. 6 is a fragmentary section with parts shown conventionally on line 6—6 of Fig. 1 showing further details of the paper feed mechanism and its control.

In the accompanying drawings I have not illustrated the details of the article feed and wrapping machanism, which is designated generally by the numeral 1. It will be understood that my present improvements have particularly to do with the delivery of the paper to the wrapping mechanism in proper relation to the package or article to be wrapped so that the design appearing on the wrapper is in proper position on the package or in proper register therewith.

The frame 2 is common to the paper feed and wrapping mechanism and is of suitable design to support the operating parts.

The roll 3 of paper is rotatably supported by the cores 4 mounted on the shaft 5. The web 6 of paper has suitable repeated designs indicated conventionally at 7 thereon and has a series of perforations 8 in definite relation to the designs, each design section constituting a wrapper.

The paper is driven by the rolls 9 and 10, and the shaft 11 of the lower roll is provided with a pinion 12 meshing with a pinion 13 on the shaft 14 of the upper roll.

At the rear of the feed rolls is a cutter mechanism comprising the roll 15 having a longitudinal groove 16 therein to receive the knife 17 on the rotary cutter 18.

The shaft 19, see Fig. 1, is provided with a beveled pinion 20 meshing with the beveled gear 21 driven by the sprocket chain 22 on the driving sprocket 23, the shaft 24 of which is in driving relation to the wrapping mechanism. The driving connections are not here illustrated.

The feed roll 9 is provided with a pinion 25, see the left hand side of Fig. 1 and Fig. 4, which is connected to a pinion 26 on the shaft 19 through a gear 27 which constitutes a timing gear; that is, it determines the amount of paper fed for each wrapper. The spindle 28 of this timing or transmission gear is mounted in a vertical slot 29 in the bracket 30 so that the spindle may be adjusted in accordance with the size of the gear employed. It is evident that by varying the size of this gear the relative speed of the feed roll is controlled.

The cutter 18 is connected to the shaft 19 by a gear 31 on the shaft of the cutter 18. With this arrangement the feed rolls and cutter are driven in timed relation.

The pinion 25 is rotatably mounted on the shaft 11 and provided with a jaw clutch 33 coacting with the jaw clutch 34 splined to the shaft 11 of the feed roll so that when these clutch members are in engagement, the feed rolls are driven but stand idle when the clutch

is released. I have not illustrated the details of this clutch as clutches of this type are well-known in the art, and any suitable clutch may be employed in this relation.

To prevent overthrow and overrunning of the feed rolls when the clutch is released, I provide a band brake 35 coacting with a drum 36 on the shaft 11, see Fig. 4. One end of the band 35 is connected to the bracket 37 by means of the bolt 38 and the other end of the band is engaged with the bolt and urged outwardly by means of the coiled spring 39 on the bolt. A thumb screw 40 is provided for adjustment of the brake.

The clutch is controlled from the cam 41 and the electrical control which will be hereinafter described. The cam 41 coacts with the lever 42 pivoted at 43 and connected by the link 44 to the arm 45 on the shifting lever 46 which is pivoted at 47 to coact with the clutch member 34. The link 44 is provided with a spring 48 through which the power is applied to the arm 45 so that, in the event of the teeth of the clutch striking on their ends, the spring will yield to prevent breakage and urge complete engagement of the clutch.

The lever 42 is provided with a locking means consisting of the catch 49 pivotally mounted at 50 on the reciprocating rod 51 connected to the lower end of the lever 42 reciprocatingly mounted at 52 and 53, see Fig. 3. The latch 49 is pivoted on a collar 54 on this rod 51. The latch is supported at its opposite end by the link 55 pivoted to a fixed part of the frame at 56 and to the latch at 57. A stop 58 limits the downward swing of this latch.

The detent 60 pivoted at 61 and connected to the armature 62 of the electromagnet or solenoid 63 coacts with this latch to hold the clutch in engagement until the electromagnet is energized to release the latch.

The parts are actuated to latching position by means of the coiled spring 64 arranged upon the rod 51 with one end in engagement with the thrust block or collar 65 of electrical insulating material and the other with the support 52, so that the spring acts to urge the upper end of the lever against the cam disk 41.

The electromagnet or solenoid 63 is controlled by the contact disks 66 coacting with the contact bar 67 which is ground in the frame of the machine. The contact disks 66 are mounted in holders 68 carried by the pivoted arms 69 on the brackets 70 carried by the contact rod 67. The holders 68 are of electrical insulating material such as hard fiber.

The contact disks 66 are positioned in alinement with the series of holes 8 in the web of paper so that when these holes are brought into register with the rollers by the feeding of the paper the rollers make contact with the contact rod 67. The rollers preferably have a V-shaped or knife edge so that when waxed paper is employed the wax does not accumulate on the roller and thereby prevent effective electrical contact. The rollers are yieldingly urged against the paper by coiled springs 71.

The contact disks are connected by the wires 72 to the electromagnet 63. This electromagnet has a make and break ground connection consisting of the contact 73 connected by the wire 74 to the electromagnet. This contact 73 is insulated from the frame as indicated in Fig. 4 and is engaged by the collar or latch carrier 54 on the rod 51 when the latch is in locking position, thereby completing the circuit when the contact disks 66 engage the contact rod 67 through the openings 8, actuating the electromagnet and releasing the clutch through the mechanism described, and stopping the feed of the paper in proper relation to the designs appearing thereon so that the successive wrappers are severed at the proper point.

As the cutter rolls and, consequently, the cam 41 are continuously driven, the cam acts to re-engage the clutch and thereby drive the feed rolls. The result is that the wrappers are severed from the web at the proper point relative to the series of designs appearing thereon, and the wrappers are fed to the wrapping mechanism in proper synchronism with the actuation of the wrapping mechanism. As stated, the details of this wrapping mechanism are not illustrated as they form no part of my present invention.

To properly aline the web or roll of paper its supporting spindle 5 is mounted for longitudinal adjustment in its bearings 75. Parallel with this spindle 5 I mount a screw 76 having a grooved adjusting nut 77 therein engaging the flanged collar 78 on the spindle so that, by rotating the adjusting nut, the spindle is moved longitudinally. A locking nut 79 is provided for holding the nut 77 in its adjusted positions.

By this means the web of paper can be adjusted to properly aline with the wrapping mechanism and with the contact rollers 66. The brackets 70, however, are adjustably mounted on the contact rod 67 so that they may be adjusted to the particular width of the wrapper or other spacing of the holes 8.

To tension the web of paper and prevent buckling or slack as it passes over the contact rod, I provide a guide roller 80 below the rod and a guide roller 81 above with a tension roller 82 carried by the arms 83. The tension roller engages the web between the roller 80 and the roll of paper. The arms 83 of this tension roller are held under spring tension by means of the coiled springs 84.

To facilitate threading the paper in the machine the shaft 14 of the upper feed roll 10 is mounted for vertical movement in the bearings 85, see Fig. 4. The levers 86 having

cams 87 thereon are mounted on the shaft of the lower feed roll so that they may be swung under the shaft of the upper feed roll, thereby lifting it and permitting the ready insertion of the paper.

With the parts thus arranged the operation of the machine is as follows: The web of paper having the apertures 8 therein associated in definite relation to the wrapper units is the control means which definitely times the feeding of the paper to the cutting mechanism, and thereby insures cutting at the proper point. The cam 41 is continuously driven with the cutting mechanism. The clutch in the structure illustrated is interposed between the cutting mechanism and the feed rollers.

When the web has been advanced to the proper point the mechanism described, controlled by the contacts acting through the perforations, releases the clutch, thereby stopping the feed at the proper point for cutting, the clutch being immediately reengaged by the cam 41.

I have illustrated and described my improvements in an embodiment which I have found very practical. I have not attempted to illustrate and describe various modifications and adaptations thereof as I believe this disclosure will enable those skilled in the art to embody or adapt my improvements as may be desired.

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

1. An apparatus for cutting into sheets a rolled web of paper comprising a series of wrapper units and having a longitudinal series of apertures in correspondingly associated relation to the wrapper units, comprising a longitudinally adjustable supporting spindle for said roll of paper, a pair of coacting paper feed rollers, driving means for said rollers including a clutch, a pair of coacting rotary cutter members disposed at the rear of the feed rollers, a clutch control means including a driven clutch engaging cam operatively associated with said cutter members and a detent for holding said clutch in engaged position, a spring acting to disengage said clutch when said detent is released, an electromagnet operatively associated with said detent, and coacting contacts disposed on opposite sides of the path of the web in alinement with the said apertures therein whereby they make contact through said apertures, one of said contacts being electrically connected to said electromagnet.

2. An apparatus for cutting into sheets a web of paper comprising a series of wrapper units and having a longitudinal series of apertures in correspondingly associated relation to the wrapper units, comprising a pair of coacting paper feed rollers, driving means for said rollers including a clutch, a pair of coacting rotary cutter members disposed at the rear of the feed rollers, a clutch control means including a driven clutch engaging cam operatively associated with said cutter members and a detent for holding said clutch in engaged position, a spring acting to disengage said clutch when said detent is released, an electromagnet operatively associated with said detent, and coacting contacts disposed on opposite sides of the path of the web in alinement with the said apertures therein whereby they make contact through said apertures, one of said contacts being electrically connected to said electromagnet.

3. An apparatus for cutting into sheets a web of paper comprising a series of wrapper units and having a longitudinal series of apertures in correspondingly associated relation to the wrapper units, comprising a longitudinally adjustable supporting spindle for said roll of paper, a pair of coacting paper feed rollers, driving means for said rollers including a clutch, a pair of coacting rotary cutter members disposed at the rear of the feed rollers, a clutch control means including a driven clutch engaging cam operatively associated with said cutter members and a detent for holding said clutch in engaged position, a spring acting to disengage said clutch when said detent is released, an electromagnet operatively associated with said detent, a contact rod disposed in supporting relation to the web of paper, contact rollers having knife edges disposed in opposed relation to said contact rod in rolling engagement with the web of paper and in alinement with the said apertures therein whereby they make contact with said contact rod through said apertures, said contact rollers being electrically connected to said electromagnet, and a ground connection for said electromagnet to said contact rod including an insulated contact electrically connected to said electromagnet and a coacting movable contact actuated with said clutch control mechanism to engage said contact when the clutch is engaged.

4. An apparatus for cutting into sheets a rolled web of paper comprising a series of wrapper units and having a longitudinal series of apertures in correspondingly associated relation to the wrapper units, comprising a longitudinally adjustable supporting spindle for said roll of paper, a pair of coacting paper feed rollers, driving means for said rollers including a clutch, a cutter means operatively associated with said feed rollers, a clutch control means including a driven clutch engaging cam and a detent for holding said clutch in engaged position, a spring acting to disengage said clutch when said detent is released, an electromagnet for releasing said detent, a contact disposed in supporting relation to the web of paper, and a coacting contact roller having a knife edge disposed in opposed relation to said first-

named contact and in yielding rolling engagement with the web of paper and in alinement with the apertures therein whereby said contacts may engage through said apertures, one of said contacts being electrically connected to said electromagnet.

5. An apparatus for cutting into sheets a web of paper comprising a series of wrapper units and having a longitudinal series of apertures in correspondingly associated relation to the wrapper units, comprising a pair of coacting paper feed rollers, driving means for said rollers including a clutch, a cutter means operatively associated with said feed rollers, a clutch control means including a driven clutch engaging cam and a detent for holding said clutch in engaged position, a spring acting to disengage said clutch when said detent is released, an electromagnet for releasing said detent, a contact disposed in supporting relation to the web of paper, and a coacting contact disposed in opposed relation to said first-named contact and in yielding rolling engagement with the web of paper and in alinement with the apertures therein whereby said contacts may engage through said apertures, one of said contacts being electrically connected to said electromagnet.

6. An apparatus for cutting into sheets a web of paper comprising a series of wrapper units and having a longitudinal series of apertures in correspondingly associated relation to the wrapper units, comprising a pair of coacting paper feed rollers, driving means for said rollers including a clutch, a cutter means operatively associated with said feed rollers, a clutch control means including a driven clutch engaging cam and a detent for holding said clutch in engaged position, a spring acting to disengage said clutch when said detent is released, an electromagnet for releasing said detent, a contact disposed in supporting relation to the web of paper, a coacting contact disposed in opposed relation to said first-named contact and in yielding rolling engagement with the web of paper and in alinement with the apertures therein whereby said contacts may engage through said apertures, one of said contacts being electrically connected to said electromagnet, and a ground connection for the other of said contacts to said electromagnet including a switch actuated by said clutch control mechanism to close the switch when the clutch is engaged.

7. An apparatus for cutting into sheets a web of paper comprising a series of wrapper units and having a longitudinal series of apertures in correspondingly associated relation to the wrapper units, comprising a pair of coacting paper feed rollers, driving means for said rollers including a clutch, a cutter means operatively associated with said feed rollers, a driven clutch engaging means, a detent for holding said clutch in engaged position, an electromagnet for releasing said detent, a contact disposed in supporting relation to the web of paper, a coacting contact disposed in opposed relation to said first-named contact and in yielding engagement with the web of paper and in alinement with the apertures therein whereby said contacts may engage through said apertures, one of said contacts being electrically connected to said electromagnet, and a ground connection for the other of said contacts to said electromagnet including a switch actuated by said clutch control mechanism.

8. An apparatus for cutting into sheets a web of paper comprising a series of wrapper units and having a longitudinal series of apertures in correspondingly associated relation to the wrapper units, comprising a pair of coacting paper feed rollers, driving means for said rollers including a clutch, a cutter means operatively associated with said feed rollers, a driven clutch engaging means, a detent for holding said clutch in engaged position, an electromagnet for releasing said detent, a contact disposed in supporting relation to the web of paper, and a coacting contact disposed in opposed relation to said first-named contact and in yielding engagement with the web of paper and in alinement with the apertures therein whereby said contacts may engage through said apertures, one of said contacts being electrically connected to said electromagnet.

9. An apparatus for cutting into sheets a web of paper comprising a series of wrapping units and having a longitudinal series of apertures therein in correspondingly associated relation to the wrapper units, comprising a paper feed means including a clutch, a cutter means operatively associated with said paper feed means, a clutch engaging means provided with a detent, an electromagnet for releasing said detent, coacting contacts electrically connected to said electromagnet and disposed on opposite sides of the web of paper in alinement with the apertures therein so that they may make contact through said apertures, and a ground connection for said contacts including a switch operatively associated with said clutch control means to close the switch when the clutch is engaged.

10. An apparatus for cutting into sheets a web of paper comprising a series of wrapping units and having a longitudinal series of apertures therein in correspondingly associated relation to the wrapper units, comprising a paper feed means including a clutch, a cutter means operatively associated with said paper feed means, a clutch engaging means provided with a detent, an electromagnet for releasing said detent, and coacting contacts electrically connected to said electromagnet and disposed on opposite sides of the web of paper in alinement with the aper-

tures therein so that they may make contact through said apertures.

11. The combination in a wrapping machine, of means for feeding wrappers thereto from a web of paper having a longitudinal series of apertures therein comprising a paper feed roller, means for driving said feed roller including a normally disengaged clutch, a cutter operatively associated with said feed means, means for initially engaging said clutch, a detent for holding said clutch in engaged position, an electromagnet for releasing said detent, a contact member disposed in supporting relation to the web of paper, a coacting contact roller disposed in opposed relation to said contact member and in alinement with the apertures in the web of paper whereby a contact may be made through said apertures, one of said contacts being operatively associated with said electromagnet, and a ground connection for the other of said contacts including a switch operatively associated with said clutch control mechanism so that it is closed when the clutch is engaged.

12. The combination in a wrapping machine, of means for feeding wrappers thereto from a web of paper having a longitudinal series of apertures therein comprising a paper feed roller, means for driving said feed roller including a normally disengaged clutch, a cutter operatively associated with said feed means, means for initially engaging said clutch, a detent for holding said clutch in engaged position, an electromagnet for releasing said detent, a contact member disposed in supporting relation to the web of paper, a coacting contact roller disposed in opposed relation to said contact member and in alinement with the apertures in the web of paper whereby a contact may be made through said apertures, one of said contacts being operatively associated with said electromagnet.

13. The combination in a wrapping machine, of means for feeding wrappers thereto from a web of paper having a longitudinal series of apertures therein comprising a paper feed roller, means for driving said feed roller including a normally disengaged clutch, a cutter operatively associated with said feed means, means for initially engaging said clutch, a detent for holding said clutch in engaged position, an electromagnet for releasing said detent, a contact member disposed on one side of the web of paper, a coacting contact disposed in alinement with the apertures in the web of paper whereby a contact may be made through said apertures, one of said contacts being operatively associated with said electromagnet, and a ground connection for the other of said contacts including a switch operatively associated with said clutch control mechanism so that it is closed when the clutch is engaged.

14. The combination in a wrapping machine, of means for feeding wrappers thereto from a web of paper having a longitudinal series of apertures therein comprising a paper feed roller, means for driving said feed roller including a normally disengaged clutch, a cutter operatively associated with said feed means, means for initially engaging said clutch, a detent for holding said clutch in engaged position, an electromagnet for releasing said detent, a contact member disposed on one side of the web of paper, and a coacting contact disposed in alinement with the apertures in the web of paper whereby a contact may be made through said apertures, one of said contacts being operatively associated with said electromagnet.

15. The combination in a wrapping machine of means for feeding wrappers thereto from a web of paper having a longitudinal series of apertures therein comprising a paper feed means, driving means therefor including a normally disengaged clutch, a cutter means operatively associated with said paper feed means, means for initially engaging said clutch, a detent for holding the clutch in engaging position, an electromagnet for releasing said detent, coacting contacts electrically associated with said electromagnet disposed on opposite sides of the web of paper so that they may make contact through said apertures, and a connection for the second contact to said electromagnet including a switch operatively associated with said clutch to close the switches when the clutch is engaged.

16. The combination in a wrapping machine, of means for feeding wrappers thereto from a web of paper having a longitudinal series of apertures therein comprising a paper feed means, driving means therefor including a normally disengaged clutch, a cutter means operatively associated with said paper feed means, means for initially engaging said clutch, a detent for holding the clutch in engaging position, an electromagnet for releasing said detent, and coacting contacts electrically associated with said electromagnet disposed on opposite sides of the web of paper so that they may make contact through said apertures.

17. The combination in a wrapping machine, of means for feeding wrappers thereto from a web of paper having a longitudinal series of apertures therein bearing a predetermined relation to the points of severance comprising a paper feed driving means including a clutch, a cutter means operatively associated with said paper feed means, means for engaging said clutch after each operation of the cutter, and an electrically controlled means for releasing said clutch comprising a coacting contact engageable through said apertures in said web of paper.

18. In an apparatus for cutting into sheets a web of paper having a series of longitudi-

nally-alined uniformly-spaced holes therein, the combination of feed rollers, a rotary cutter to which said feed rollers deliver, driving connections from said cutter to said feed rollers including a clutch, means for controlling said clutch including an electrically-activated element, and an electrical control element for said electrically-activated element of said clutch control means associated with a web of paper to be activated by the registration of the holes in said web therewith.

19. In an apparatus for cutting into sheets a web of paper having a series of longitudinally-alined spaced holes therein, the combination of feed rollers, a rotary cutter to which said feed rollers deliver, driving means for said feed rollers including a clutch, and means for controlling said clutch including an electrical element operatively associated with the web of paper to be successively activated by the holes therein as the paper is advanced by said feed rollers.

20. In an apparatus for cutting into sheets a web of paper having a series of longitudinally-alined holes therein, the combination of a paper feed means, a cutter operatively associated with said feed means, driving means for said cutter and feed means including a controlling clutch for the feed means, and means for controlling said clutch operatively associated with the web of paper so that holes in the web are successively brought into operative relation thereto as the web is advanced by the paper feed means.

21. 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 driving clutch for said paper feed means, and means activated by said electric element actuators for controlling said clutch.

22. In an apparatus for cutting into sheets a web of paper having a longitudinal series of holes, the combination of a paper feed means, a paper cutter operatively associated with said paper feed means, a driving clutch for said paper feed means, and means activated by the said holes in said web of paper for releasing said clutch.

In witness whereof I have hereunto set my hand.

CHARLES F. RICHARD.