No. 852,663. PATENTED MAY 7, 1907.

D. T. IGOU.

FEEDING AND CUTTING ATTACHMENT FOR WRAPPING MACHINES.

APPLICATION FILED SEPT. 20, 1906.

4 SHEETS—SHEET 1.

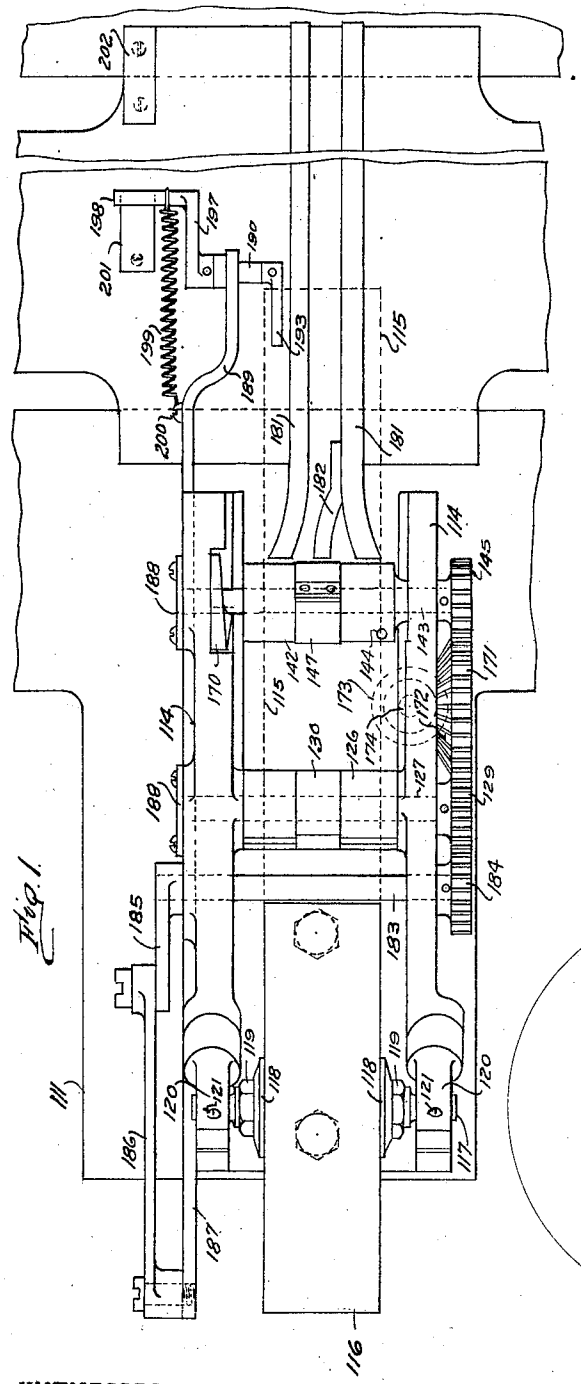


Fig. 1.

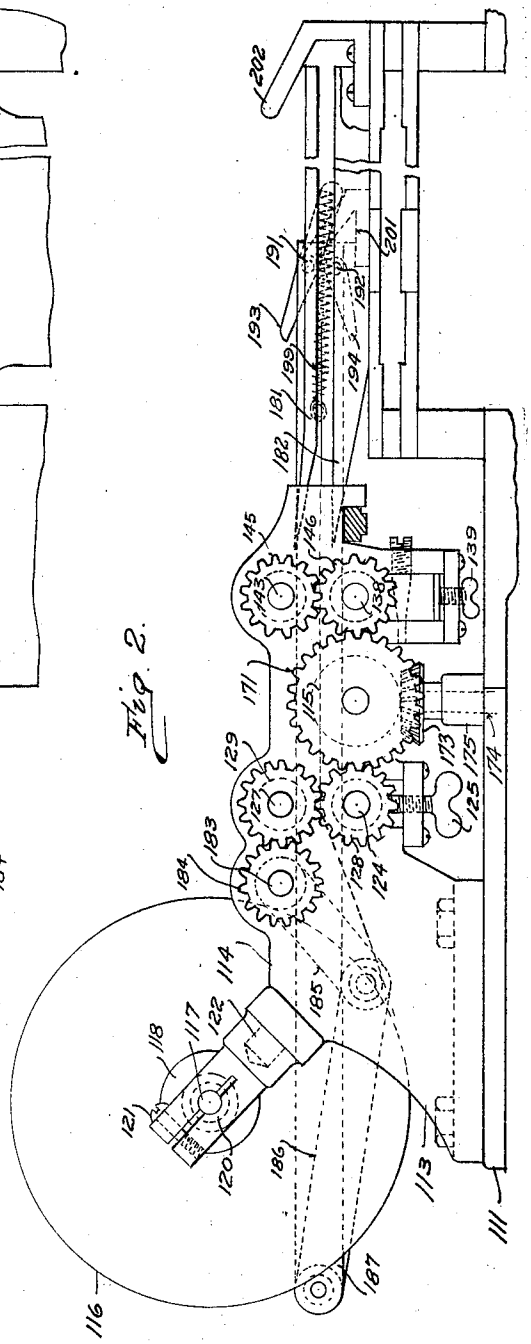


Fig. 2.

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4 SHEETS—SHEET 2.

Fig. 3.

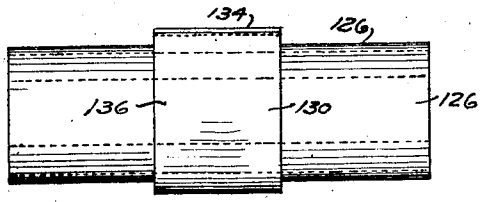


Fig. 4.

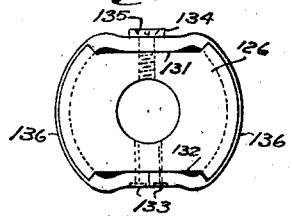


Fig. 5

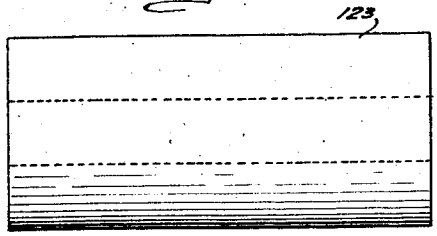


Fig. 6.

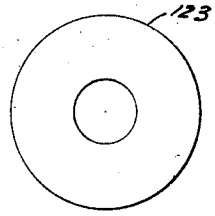


Fig. 7.

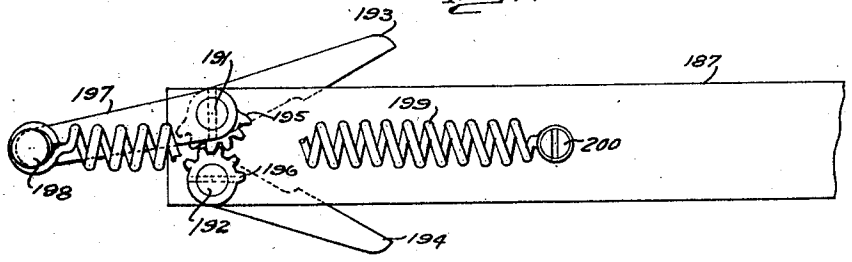
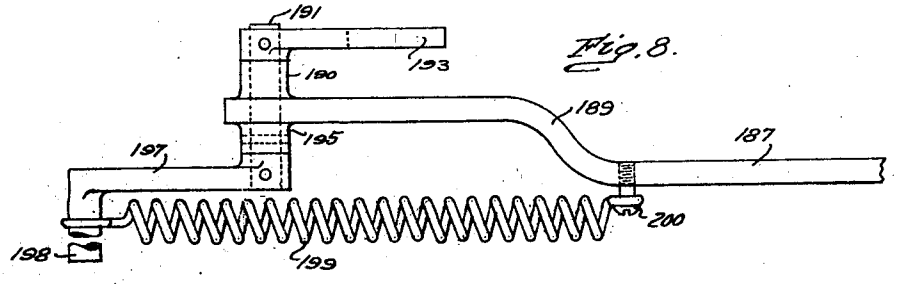


Fig. 8.



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No. 852,663. PATENTED MAY 7, 1907.

D. T. IGOU.

FEEDING AND CUTTING ATTACHMENT FOR WRAPPING MACHINES.

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4 SHEETS—SHEET 3.

Fig. 9.

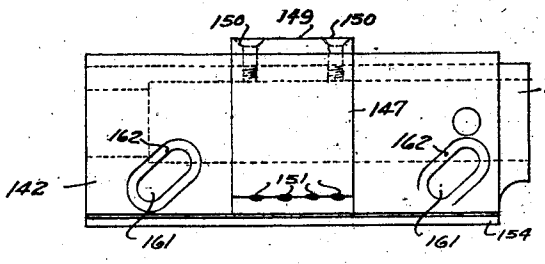


Fig. 10.

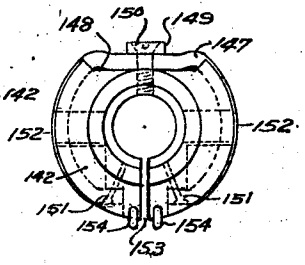


Fig. 11.

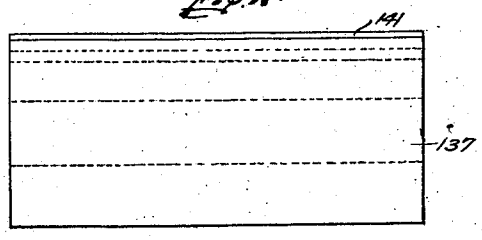


Fig. 12.

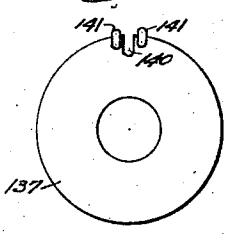


Fig. 13.

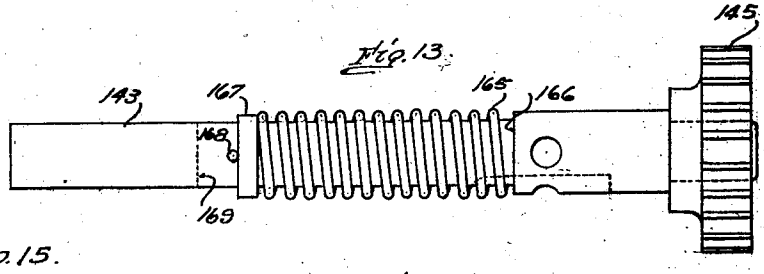


Fig. 15.

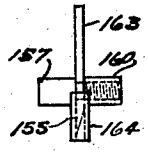


Fig. 14.

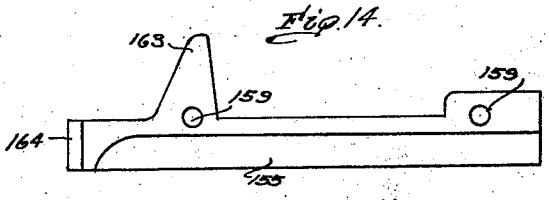


Fig. 16.

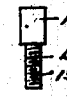


Fig. 17.



Fig. 18.

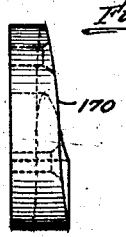
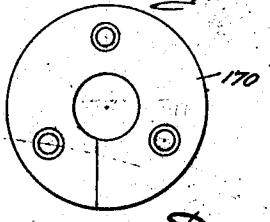


Fig. 19.



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No. 852,663. PATENTED MAY 7, 1907.

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FEEDING AND CUTTING ATTACHMENT FOR WRAPPING MACHINES.

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4 SHEETS—SHEET 4.

Fig. 20.

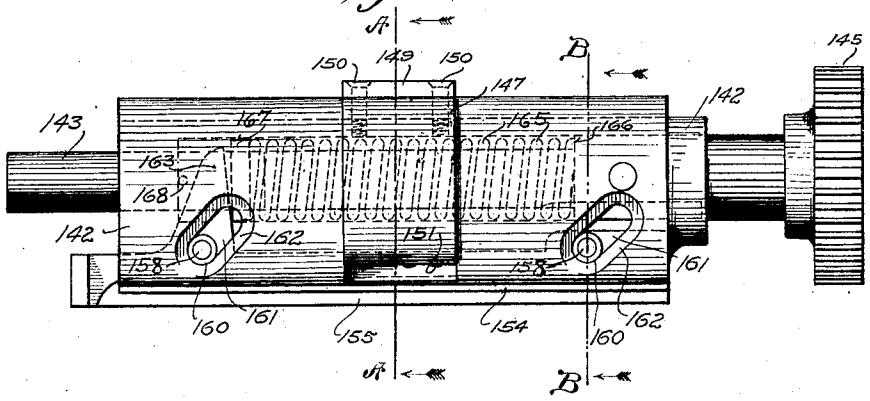


Fig. 21.

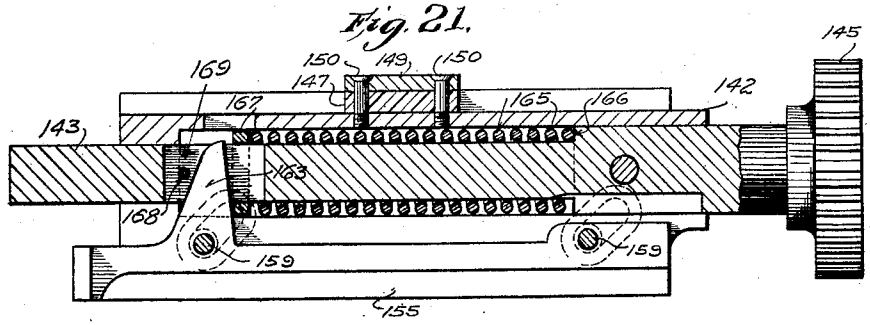


Fig. 22.

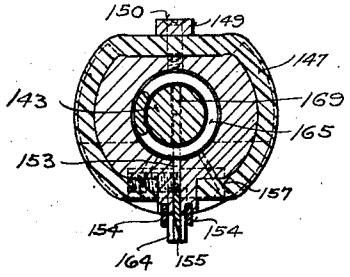
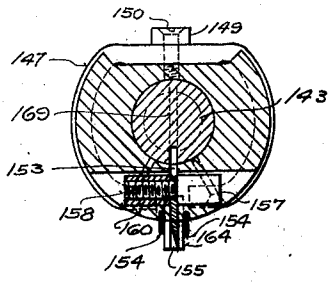


Fig. 23.



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Edward F. Reed

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BY H. A. Toulmin,

ATTORNEY.

UNITED STATES PATENT OFFICE.

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FEEDING AND CUTTING ATTACHMENT FOR WRAPPING-MACHINES.

No. 852,663. Specification of Letters Patent. Patented May 7, 1907.

Application filed September 20, 1906. Serial No. 335,417.

To all whom it may concern:

Be it known that I, DENNIS T. IGOU, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Feeding and Cutting Attachments for Wrapping-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to machines for forming and wrapping confections and other articles, and more particularly to paper-feeding and sheet-forming mechanism, and has for its object to provide a mechanism which will act to draw a web of paper suitable for forming wrappers, preferably what is known as waxed or paraffin paper, from a continuous roll, feeding the same forward rapidly and smoothly, severing it into sheets of the proper size to form wrappers, and delivering these sheets to a wrapping mechanism or to any other desired point.

To these ends the invention consists in certain novel features which I will now proceed to describe, and will then particularly point out in the claims.

In the accompanying drawings, Figure 1 is a plan view of a mechanism embodying my invention in one form; Fig. 2 is a side elevation of the same; Fig. 3 is a side elevation of the upper one of the first pair of paper feeding rolls, detached; Fig. 4 is an end view of the same; Fig. 5 is a similar view to Fig. 3, illustrating the lower one of the first pair of paper feed rolls; Fig. 6 is an end view of the same; Fig. 7 is an enlarged detail view of the gripping jaws, viewed in elevation from the side opposite to that shown in Fig. 2; Fig. 8 is a plan view of what is shown in Fig. 7; Fig. 9 is an elevation of the upper one of the second pair of paper feed rolls; Fig. 10 is an end view of the same; Fig. 11 is an elevation of the lower one of the second pair of paper feed rolls; Fig. 12 is an end view of the same; Fig. 13 is a view of the shaft which carries the feed roll shown in Figs. 9 and 10, the same being shown detached and with its spring and thrust collar mounted thereon; Fig. 14 is an elevation of the paper knife, detached; Fig. 15 is an end view of the same; Fig. 16 is a detail view of one of the bolts carried by said knife; Fig. 17 is a similar view of the corresponding sleeve nut; Fig. 18 is an edge view of the cam which controls the paper knife; Fig. 19 is a face view of the same; Fig. 20 is a side elevation of the feed roll carrying the cutter; Fig. 21 is a longitudinal section taken vertically through Fig. 20; Fig. 22 is a transverse section, taken on the line A A of Fig. 20; and Fig. 23 is a transverse section taken on the line B B of Fig. 20.

In the said drawings the mechanism is shown supported on a suitable base 111, which supports a bearing bracket 113, comprising parallel side members 114, which support the various moving parts.

The paper, the web of which is indicated by the reference numeral 115, is supplied in the form of a roll 116, which is secured on a shaft 117 by means of clamping disks 118 and nuts 119, so as to rotate in unison with said shaft. The shaft 117 is mounted in bearings 120, which are split or divided, as shown in Figs. 1 and 2, the two parts being connected by a screw 121, by means of which the bearings may be clamped upon the shaft 117, so as to act as a brake upon said shaft, and thus give the necessary tension to the paper. The bearings 120 fit removably upon inclined studs 122, shown in dotted lines in Fig. 2, projecting from the bracket members 114, the construction being such that the roll of paper and its bearings may be readily removed and replaced.

The web of paper, after it leaves the roll, passes through the feed rolls, of which two pairs are shown in the present instance, although a greater number of pairs of feed rolls may be employed if desired. The first pair of feed rolls through which the paper passes are shown in detail in Figs. 3 to 6 of the drawings, inclusive. The lower roll of this pair, indicated by the reference numeral 123, is a cylindrical roll, secured upon a shaft 124, the bearings of which are mounted in the members 114, and are vertically adjustable by means of screws 125, in order to bring the lower feed roll into proper relation to the upper feed roll. The upper feed roll of this pair, indicated by the reference numeral 126, is mounted upon a shaft 127, having suitable bearings in the frame members 114. The shafts 124 and 127 are respectively provided

with gears 128 and 129, which intermesh so as to cause the rolls to rotate in unison. The feed roll 126 is grooved circumferentially at its central portion, and in the groove thus formed there is located a band or covering 130, of yielding material having good gripping qualities, leather being preferable for the purpose. The feed roll 126 is also cut away or flattened longitudinally on its opposite sides, as indicated at 131 and 132, and these flattened portions are utilized for the securing devices which hold the leather covering to the roll. The meeting ends of the leather are secured on the flattened surface 132 by screws or nails 133, while the portion of the leather which lies on the flattened surface 131 is secured in position by means of a fastening strip 134 and screws or nails 135. The portion of the leather covering between the flattened sides form feeding surfaces 136. The construction is such that the several pairs of feed rolls feed intermittently, and, in the present instance, where only two pairs of feed rolls are employed, each pair of feed rolls is provided with two feeding surfaces, the number of feeding surfaces employed being preferably identical with the number of pairs of feed rolls, and the feed rolls having their feeding surfaces so arranged that, while one of the pairs is always engaged with and feeding forward the paper, each pair in turn releases its grip upon the paper at intervals. The reason for this mode of construction and operation lies in the fact that it is extremely difficult to feed a web of paper forward in a straight line with feed rolls in constant contact therewith, owing to the inequalities in the paper, inaccuracies of the rolls and their adjustment, and other causes. When the paper once begins to depart from the proper line of feed, it tends to increase the error, particularly where more than one pair of rolls is employed, and the mechanism is apt to clog and break. By employing a plurality of feed rolls in intermittent alternating contact with the paper, each pair of rolls tends to correct the inaccuracies of the other rolls, and has an opportunity to do so, since the other rolls release the paper and leave it free to be guided by the particular pair of rolls which is engaged in feeding at that time. Thus the inaccuracies of the feeding mechanism are constantly corrected and have no opportunity to increase. The accuracy of the feed is further maintained by reason of the fact that only a relatively narrow area of the central portion of the web is actually gripped, thereby reducing the liability of inaccurate feeding in proportion to the reduction of the surface engaged.

Referring now to the second pair of feed rolls, the lower roll, indicated by the reference numeral 137, is substantially cylindrical in form, and is mounted on a shaft 138, the bearings of which are vertically adjustable in the members 114 by means of screws 139, as in the case of the bearings of the shaft 124. The roll 137 is provided on its outer surface with a longitudinal slot or groove 140, to receive the knife carried by the coöperating roll, and on each side of this groove there is located a gripper 141, preferably of leather, extending longitudinally of the roll parallel with the slot. These grippers, with two similar grippers on the coöperating roll, serve to grip the paper on each side of the line of cut and hold the same firmly while it is being severed. The upper one of the second pair of feed rolls, indicated as a whole by the reference numeral 142, is mounted upon a shaft 143, to which it is secured by a pin 144, or in any suitable manner. The shaft 143 has its bearings in the members 114, and is provided with a gear 145, which meshes with a similar gear 146 on the shaft 138 of the roll 137, to cause the two rolls to rotate in unison. The roll 142 is circumferentially grooved at its central portion to receive a covering of leather or the like, indicated at 147, the same being similar to the leather covering 130 of the roll 126, and being secured in a similar manner. The roll 142 is flattened longitudinally on one side, as indicated at 148, the leather being there secured by a fastening strip 149 and fastening devices 150. On the opposite side, the bottom of the groove or recess in which the leather is fastened is flattened at each end of said groove or recess, which does not extend entirely around the roll in this case, and the ends of the leather are turned in at these flattened portions and secured by fastening devices 151. That portion of the roll which lies below the leather in the position of the parts shown in Fig. 10 is of less diameter than the maximum diameter of the roll, including the leather covering, so that, in this case also, there are formed two feeding surfaces 152, with intermediate non-feeding surfaces, as in the case of the upper roll of the first pair. It will be understood that the two upper rolls have their feeding surfaces so arranged relatively to each other that one pair of rolls grips and feeds the paper while the other pair releases the paper. It will also be understood that the leather covering is somewhat thicker than the depth of the seat in which it is located, so that the feeding is accomplished by those portions of said covering which extend out beyond the body of the roll, said body having no feeding functions. That portion of the body of the roll 142 which is diametrically opposite to the flattened portion 148 is provided with a longitudinally extending radial slot 153, on each side of which are located parallel longitudinally-extending grippers 154, which cooperate with the similar grippers 141 of the roll 137. In the slot 153 there is located a knife 155, which may be projected from and withdrawn into the roll by mechanism pro-

vided for that purpose. To this end the knife is provided near each extremity with a transverse pin or bolt, extending laterally therefrom on each side. Preferably, these pins or bolts are constructed in the manner shown in detail in Figs. 16 and 17 of the drawings. Each comprises a bolt proper 156, having a large cylindrical head 157 and a reduced threaded shank 158. This shank is passed through an aperture 159 in the knife until the shoulder of the head bears against one side of the knife. A nut 160, in the form of a sleeve threaded internally, is then screwed upon the projecting threaded shank until the body of the knife is gripped between said sleeve and the head of the bolt. As shown in Fig. 15, the structure then presents the appearance of a pin projecting equally on each side of the knife. These pins extend into inclined slots 161, formed in the bottom walls of recesses 162, located on opposite sides of the knife slot 153 in the body of the roll 142. The knife is provided with a projection 163 on its back, which is acted on by a spring to throw the knife outward into cutting position, while the end 164 of the knife projects beyond the body of the roll, to be acted upon by a cam to move the knife inward against the action of said spring. The spring, indicated by the reference numeral 165, is coiled upon the shaft 143, which is reduced for a portion of its length to form a shoulder 166, against which one end of the spring abuts. The other end of the spring abuts against a thrust collar 167, fitted to slide longitudinally on the shaft, its movement being limited by a stop pin or projection 168. The shaft is slotted longitudinally at 169, as indicated in dotted lines in Fig. 13, and the projection 163 on the knife extends into this slot in the path of the collar 167, which bears against it. Thus the spring 165 constantly tends to move the knife to the left with respect to the roll, in the position of the roll shown in Fig. 9, and the inclination of the slots 161 is such that this movement of the knife to the left causes it to project outward beyond the body of the roll 142, so as to enter the slot 140 of the coöperating roll 137, and thereby sever the paper.

As already stated, the paper is held firmly gripped on each side of the line of cut during this operation by the gripping projections 141 and 154, so that the cut is effective. Moreover, the movement of the knife is diagonal, giving a draw-cut, which is desirable. The position of the knife at the time when it is projected from the roll to act, and withdrawn into the roll when not acting, is determined by a fixed cam 170, secured to one of the bearings of the shaft 143, in a position such that the projecting end 164 of the knife is held against said cam by the action of the spring 165. The cam is of a shape such as to project the knife and sever the web at the proper moment. Simultaneous motion is imparted to both pairs of feed rolls from a gear 171, which meshes with the gears 146 and 128 of the two lower rolls, and which is itself driven by means of a bevel gear 172, formed on its inner face and meshing with a bevel pinion 173 on the upper end of a vertical shaft 174, mounted in bearings 175 on the base 111.

After passing the feeding rolls, the paper travels between guides 181 and 182 above and below the same, the severed sheets being drawn along by means of traveling gripping jaws which engage the leading edge of the sheet and carry it positively away from the rolls. The operating mechanism of these gripping jaws comprises a shaft 183, mounted in suitable bearings in the members 114, and having a gear 184 at one end, which meshes with the gear 129. The other end of the shaft 183 is provided with a crank 185, to which is pivoted one end of a connecting rod 186. The other end of said connecting bar is pivoted to a bar 187, which slides longitudinally in guides 188, mounted on one of the members 114. The connecting rod 186 is pivoted to the rear end of the slide-bar 187, and the forward end of said slide-bar is deflected inward, as shown at 189, and is provided with bearings 190, in which are mounted the shafts 191 and 192 of the gripping jaws 193 and 194. These shafts are provided respectively with intermeshing gears or gear segments 195 and 196, so that the gripping jaws move simultaneously toward and from each other. The shaft 191 of the upper gripping jaw has secured thereto, on the end thereof opposite to that on which the gripping jaw 193 is mounted, an arm 197, provided at its free end with a laterally extending pin 198. A coiled spring 199 has one of its ends connected to the pin 198, its other end being secured at 200 to the slide-bar 187. The arrangement of the connections of the ends of this spring is such that it acts either to hold the gripping jaws open, as shown in Fig. 7, or to hold them closed, according to which side of the center of the shaft 191 said spring lies upon. In other words, the spring is neutral when the connection 200, shaft 191 and pin 198 are in alinement. When the pin 198 moves downward from this position, the spring forces the jaws open, and when the pin 198 moves upward from this alinement, the spring forces the jaws closed. The movements of the pin 198, and, consequently, the opening and closing of the jaws, are determined by two fixed cams, 201 and 202, located in the path of the pin 198. As the slide-bar 187 moves to the left in Figs. 1 and 2, with the gripping jaws open, and approaching the edge of the paper, the pin 198 strikes the inclined cam 201 on the upper side thereof, and said pin is moved upward until it passes beyond the line pass-

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ing through the connection 200 and shaft 191, whereupon the spring 199 snaps the gripping jaws together with the forward margin of the paper between them. The knife having operated to sever the web, the direction of the travel of the slide-bar is reversed, and the gripping jaws move in the opposite direction, carrying with them the severed sheet. As the slide-bar approaches the limit of its movement in this direction, the pin 198 comes into contact with the under surface of the inclined cam 202, and said pin is forced downward until it reaches a position where the spring 199 acts upon it in such a way as to throw open the gripping jaws, thereby releasing the sheet of paper at the end of the stroke of the gripping jaws, which latter then returns to grip the next sheet and carry it to its destination.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

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

1. In a paper feeding mechanism for wrapping machines and the like, a roll support comprising a base having projecting studs, bearings removably fitting said studs, slit through their bearing apertures, and provided with clamping screws for drawing together the slitted parts, and a roll supporting shaft mounted to rotate in said bearings and provided with means for holding a roll of paper thereon, substantially as described.

2. A paper feeding mechanism for wrapping machines and the like, comprising a plurality of pairs of feed rolls, each pair constructed and arranged to alternately grip and release the paper, the gripping and feeding action of the respective pairs being successive, substantially as described.

3. In a paper feeding mechanism for wrapping machines and the like, a plurality of pairs of feed rolls, each pair constructed and arranged to alternately grip and release the paper, the respective pairs of rolls acting successively upon the paper, one pair at a time, to give the same a continuous feed, substantially as described.

4. In a paper feeding mechanism for wrapping machines and the like, a pair of feed rolls, one of which is provided with a gripping and feeding surface restricted to a relatively narrow central portion of the same and a knife extending the full length of said roll, substantially as described.

5. In a paper feeding mechanism for wrapping machines and the like, a pair of feed rolls, one of which is circumferentially grooved at its central portion and provided with a band or covering of gripping material, such as leather, seated therein to form a gripping surface and a knife mounted in one of said rollers and extending the full length thereof, substantially as described.

6. In a paper feeding mechanism for wrapping machines and the like, feed rolls arranged in pairs, one roll of each pair being provided with alternate gripping and release portions, the gripping portions of the respective pairs being arranged to operate successively, one at a time, to give the paper a continuous feed, substantially as described.

7. In a paper feeding mechanism for wrapping machines and the like, feed rolls arranged in pairs, one roll of each pair being circumferentially grooved and longitudinally flattened, a gripping band seated in the circumferential groove, and fastening devices for securing the band to the roll at the flattened places, substantially as described.

8. In a paper feeding mechanism for wrapping machines and the like, a plurality of pairs of feed rolls having alternating gripping and release surfaces and arranged to successively act upon the paper, one of the rolls of the last pair having a knife mounted therein and adapted to be projected from one of the release surfaces thereof, substantially as described.

9. In a paper feeding mechanism for wrapping machines and the like, a plurality of pairs of feed rolls having alternating gripping and release surfaces and arranged to successively act upon the paper, one of the rolls of the last pair having a knife mounted therein and adapted to be projected from one of the release surfaces thereof, said roll and its coöperating roll having grippers arranged to grip the paper along each side of the knife during the cutting operation, substantially as described.

10. In a paper feeding mechanism for wrapping machines and the like, a pair of feed rolls, one of which is provided with a longitudinal radial slot, a knife mounted to move in and out in said slot, and means for projecting the knife beyond said roll when opposite the coöperating roll, said coöperating roll being provided with a longitudinal groove to receive said knife, both of said rolls being provided with longitudinal gripping strips arranged to grip the paper on both sides of the knife during the cutting, substantially as described.

11. In a paper feeding mechanism for wrapping machines and the like, a feed roll having a radial slot and inclined slots arranged transversely thereto, a knife mounted to slide in the radial slot and having projections engaging the inclined slots, a spring acting against the knife axially of the roll to force the same outward, and a fixed cam against which the knife bears to control the movements of the knife relatively to the roll, substantially as described.

12. In a paper feeding mechanism for

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wrapping machines and the like, a hollow feed roll having a longitudinal radial slot and inclined transverse slots, a shaft on which said roll is mounted, said shaft being transversely slotted and being provided with a spring and thrust collar, a knife mounted to slide in the radial slot of the roll, provided with projections to engage the inclined slots thereof, and having a projection extending through the slot of the shaft and engaged by the thrust collar, said knife extending beyond said roll at one end, and a fixed cam located at said end of the roll, against which cam the projecting end of the knife is held by the spring, substantially as described.

13. A paper feeding mechanism for wrapping machines and the like, comprising feed rolls for feeding forward a web of paper, means for severing said web to form wrapping sheets, a reciprocating gripper acting to grip the severed sheet and carry the same forward to the place of delivery and a fixed part for actuating said gripper, substantially as described.

14. A paper feeding mechanism for wrapping machines and the like, comprising feed rolls for feeding forward a web of paper, guides for supporting the paper beyond said feed rolls, means for severing the web to form wrapper sheets, a gripper acting to seize the severed sheets and carry them forward through the guides to the place of delivery and a fixed part for actuating said gripper, substantially as described.

15. A paper feeding mechanism for wrapping machines and the like comprising a plurality of pairs of feed rolls, one of the rolls of the last pair having mounted therein a knife whereby the web of paper is severed to form wrapper sheets, and a reciprocating gripper acting to grip the severed sheets and carry them forward to the place of delivery, substantially as described.

16. A paper feeding mechanism for wrapping machines and the like comprising a plurality of pairs of feed rolls, one of the rolls of the last pair having mounted therein a knife whereby the web of paper is severed to form wrapper sheets, guides for the paper extending forward from said last pair of rolls, and a reciprocating gripper acting to grip the severed sheets and carry them forward through the guides to the place of delivery, substantially as described.

17. A paper feeding mechanism for wrapping machines and the like, comprising a supporting frame or bracket, a roll support, feeding rolls, means for driving said feeding rolls, a cutter, a crank shaft, driven in unison with the feeding rolls, a slide provided with a gripper, a link connecting said slide with the crank of the crank shaft, and fixed means for opening and closing the gripper, substantially as described.

18. In a paper feeding mechanism for wrapping machines and the like, sheet-feeding means comprising a reciprocating slide, gripping jaws having their shafts mounted therein and geared together to move in unison toward and from each other, one of said shafts being provided with an actuating arm, a spring connecting said arm to the slide and acting to hold said jaws in open or closed position, and fixed cams arranged in the path of said arm to swing the same over to cause the spring to act in the appropriate direction, substantially as described.

19. In a paper feeding mechanism for wrapping machines and the like, sheet-feeding mechanism comprising a reciprocating slide, gripping jaws having their shafts mounted therein and geared to move in unison toward and from each other, one of said shafts being provided with an arm having a laterally extending pin, a tension spring connecting said pin and the slide and acting to open or close the jaws when moved to one side or the other of the axis of the arm bearing jaw, and fixed cams arranged in the path of the pin and acting to move the same to carry the spring to one side of said axis at one end of the stroke of the gripper and to the other side of said axis at the other end of said stroke, substantially as described.

20. In a paper feeding mechanism for wrapping machines and the like, a plurality of pairs of feed rolls acting only upon a relatively narrow central portion of the web of paper, each pair constructed and arranged to alternately grip and release the paper, the gripping and releasing action of the respective pairs being successive to effect a continuous straight feed, substantially as described.

In testimony whereof, I affix my signature in presence of two witnesses.

DENNIS T. IGOU.

Witnesses:
HARRIET L. HAMMAKER,
F. W. SCHAEFER.