June 16, 1925. 1,542,104

E. L. SMITH

STRIP FEEDING, CUTTING, AND DELIVERING MECHANISM

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Fig. 1.

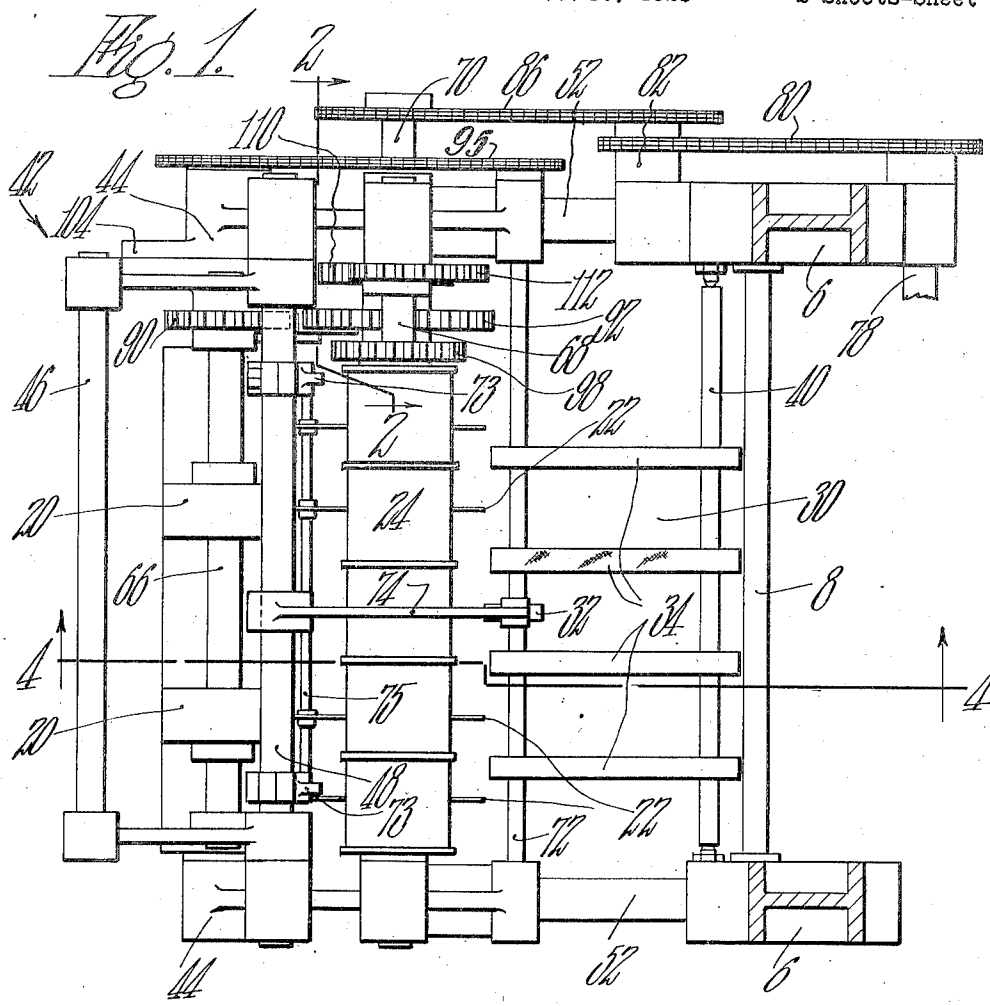


Fig. 2.

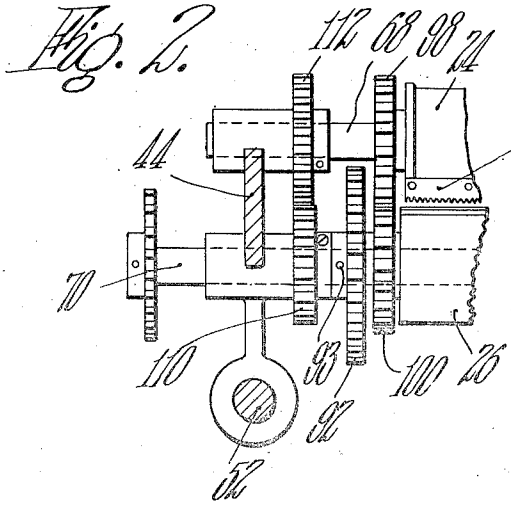
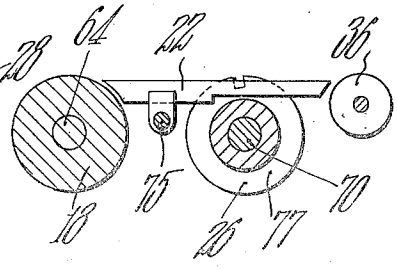


Fig. 3.



INVENTOR
Elmer L. Smith
BY Chapin & Neal
ATTORNEYS.

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Fig. 4.

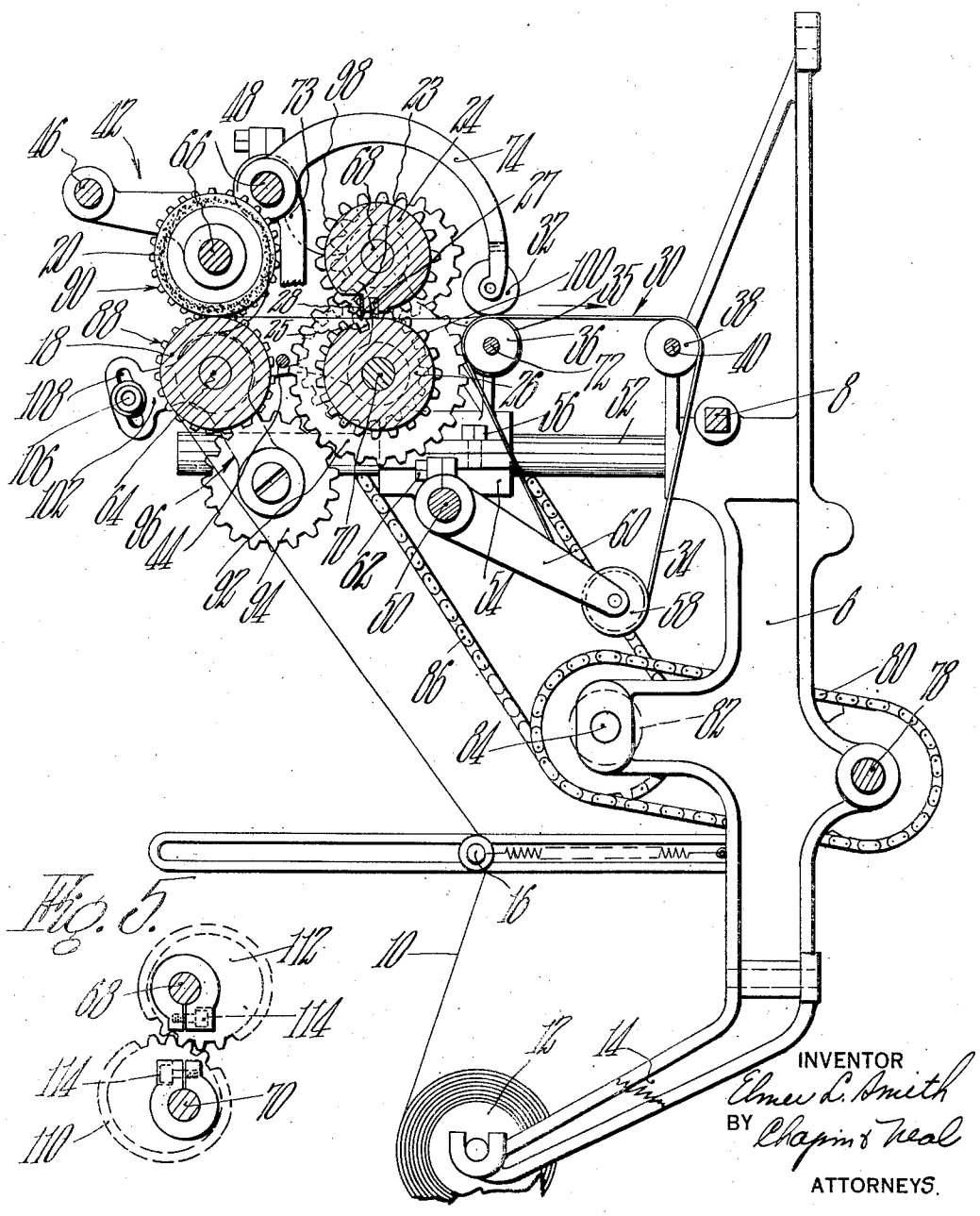


Fig. 5.

INVENTOR
Elmer L. Smith
BY Chapin & Neal
ATTORNEYS.

Patented June 16, 1925. 1,542,104

UNITED STATES PATENT OFFICE.

ELMER LOVELL SMITH, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR TO PACKAGE MACHINERY COMPANY, OF SPRINGFIELD, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

STRIP FEEDING, CUTTING, AND DELIVERING MECHANISM.

Application filed November 15, 1921. Serial No. 515,264.

To all whom it may concern:

Be it known that I, ELMER LOVELL SMITH, citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Strip Feeding, Cutting, and Delivering Mechanism, of which the following is a specification.

The present invention relates to strip feeding, cutting and delivering mechanism, and more particularly to mechanism of the character employed in connection with wrapping or analogous machines for feeding a continous strip of paper or other sheet material from a roll, cutting the strip into sheets of uniform length as it is fed, and delivering the sheets successively to mechanism for folding or otherwise operating thereupon.

One object of the invention is to provide certain improvements in mechanism of the above named general character, to facilitate the initial setting of the mechanism during the assembly of its parts to enable it to cut and deliver sheets or pieces of any required length, within certain limits, or to facilitate the subsequent adjustment of the mechanism to vary the length of the pieces cut thereby.

Another object of the invention is to provide for the above described initial setting of the mechanism as nearly as possible without the use of specially designed interchangeable parts, or for said subsequent adjustment of the mechanism by the replacement of a minimum number of its parts.

To the accomplishment of these objects, provision is made whereby the rate of feed of the strip of stock per cycle of operations of the mechanism, may be initially determined or subsequently varied by the inclusion or substitution, respectively, in the train of gearing which transmits motion to the strip feeding means, of a single gear, the diameter of which is determined in accordance with the rate of feed and length of sheet required. To facilitate the assembly in the driving train of a gear the size of which is variable in accordance with the length of the sheets to be produced by the mechanism, and also to permit the later removal of said gear and its replacement by another gear of a different size, certain novel features of construction and arrangement of parts will be hereinafter described and claimed.

Strip feeding and cutting mechanisms of the general character herein described are commonly provided with a rotary knife the cutting edge of which is parallel to its axis of rotation and transversely disposed with respect to the strip to be operated upon. The knife is driven in timed relation with the strip feeding means and operates once at each rotation to sever a sheet from the leading end of the strip. It is highly desirable, as is well understood by those skilled in the art, that both the knife and the strip should travel at the same rate of speed during the performance of the cutting operation in order to insure the best results. It is apparent, therefore, that if a change is to be made in the rate of feed of the strip, provision should also be made for a corresponding change in the rate of travel of the knife at the time the cutting occurs. Furthermore it is possible that, for some cause or other such as the wearing of parts after continued use of the mechanism, the peripheral speed of the knife at the time of the cutting operation may gradually change so as to become either slower or faster than the rate of feed of the strip.

A further object of the present invention is to enable the desired rate of travel of the knife at the time of the cutting to be initially provided for or subsequently obtained by the making of a simple adjustment, not involving the selection and use of parts specially designed for variable conditions.

With this object in view, an important feature of the invention resides in the provision, in a strip feeding, cutting and delivering mechanism of the type in which a continuously advancing strip is cut into sheets of uniform length by a rotating knife, of means for rotating the knife at a variable speed through each rotation, said means being constructed and arranged to permit of its adjustment for the purpose of varying the time relation of any phase of said variable rotary movement to the time of the cutting operation. In the preferred construction for securing this result, the variable speed of rotation of the knife is attained by the use of intermeshing elliptical gears and the above described variation of phase is obtainable by radial adjustment of the ellip-

tical gears upon their shafts. If at any time it should be necessary to modify the time relation of said phase to compensate for a change therefore such as might be gradually effected by continued use of the mechanism and which would alter the knife speed at the time of cutting, it is obvious that such modification may be effected by radial readjustment of the elliptical gears, thus avoiding the necessity of replacing worn parts or interfering with the mounting of the knife.

The invention further contemplates the adjustment of the means for imparting rotation at a variable speed to the knife so that the cutting operation will occur while the speed of rotation of the knife is increasing. Thus adjustment may be made so that the knife will be traveling as fast as the strip when it comes into contact therewith for cutting and immediately after cutting the knife will be traveling faster than the strip. Thus the knife will be quickly withdrawn from in front of the strip and will not obstruct the free advance of the latter. Such a result, while highly desirable, has not been attained heretofore so far as the inventor is now aware.

The invention further consists in other particulars of construction and arrangement hereinafter set forth, permitting convenient assembly or adjustment of certain parts of the mechanism in different relative positions to adapt the mechanism for cutting and delivering sheets or pieces of different lengths.

The invention will be best understood from a description of the preferred embodiment thereof, illustrated in the accompanying drawings, in which:—

Fig. 1 is a plan view of a mechanism constructed in accordance with the invention;

Fig. 2 is a detail view partially in elevation and partially in section on the line 2—2 of Fig. 1;

Fig. 3 is a detail sectional view showing particularly one of the stationary strip supports;

Fig. 4 is a sectional view of the entire mechanism, the section being taken along the line 4—4 of Fig. 1; and

Fig. 5 is a detail view illustrative of the means for imparting rotation at a variable speed to the cutting knife.

Referring to the drawings, the mechanism embodying the present invention is shown as supported by upright frame members 6 which may be rigidly tied together by means of a transverse rod 8, and which are adapted to be bolted to the side of the wrapping machinery or other machine to which the present mechanism is applied. The paper strip or web 10 which is to be operated upon is unwound from a roll or reel 12 which is rotatably supported between suitable brackets 14 extending from the lower end of the frame member 8. The strip 10 leads upwardly from the roll 12, passing over a yielding take-up roller 16, of well known construction, and extending between cooperating driven feed rolls 18 and 20. The leading end of the strip is advanced by the feed rolls 18 and 20 across a plurality of strip supporting fingers 22 (Figs. 1 and 3 and between a knife roll 24 and a bed roll 26, the former carrying a knife 28 with which the bed roll cooperates to cut a sheet from the strip. The knife roll and the bed roll are mounted to rotate with their peripheral surfaces out of contact with each other so that a space is left between them through which the strip is free to advance. Before the occurence of each cutting operation, the leading end of the strip 10 reaches a conveyer 30 and passes beneath a driven feed roll 32 which cooperates with the conveyer to remove the sheets from the knife after they have been severed from the strip. The conveyer 30 comprises a plurality of endless belts 34 each of which is supported by rollers 36 and 38 and operates to deliver the cut sheets to the wrapping or other machinery with which the described cutting mechanism is associated.

The rolls 38 are spaced apart to support the belts 34 at the delivery end of the conveyer 30 and to this end said rolls are affixed upon a horizontal shaft 40 which is rotatably supported by the frame members 6. The rolls 36 support the belts at the receiving end of the conveyer 30 and these rolls, together with the feed roll 32, the knife roll 24, the bed roll 26 and the cooperating feed rolls 18 and 20 are all supported by a frame 42 comprising a pair of upright brackets 44 which are held in spaced apart relation by means of horizontal tie-rods 46, 48, and 50 and between which the several rolls extend. To permit the length of the conveyer 30 to be initially determined or subsequently varied in accordance with the length of the sheets to be cut, provision is made for moving the rolls 36 toward or away from the rolls 38 and for taking up slackness in the conveyer belts 34 to maintain their upper stretches taut whatever the distance between said rolls. To permit adjustment of the distance between the conveyer rolls, the frame 42 is supported with provision for sliding adjustment upon a pair of horizontal rods 52 which severally project from the frame members 6 and extend through sleeves 54 formed in the brackets 44. As shown, the sleeves 54 are split axially and the split portions are adapted to be secured together in adjusted position upon the supporting rods 50 by means of bolts 56. To take up slackness in the belts 34, belt tightners are provided, comprising flanged rollers 58 carried by arms 60 which are mounted for radial

adjustment upon the tie-rod 50. To enable the belt tightener arms 60 to be rigidly secured in radially adjusted positions upon the rod 50, the ends of said arms which encircle the rod are split radially and clamped to the rod by bolts 62 which extend through the split ends of the arms. The length of the conveyer belts and the range of adjustment of the belt tighteners is sufficient to enable the length of the conveyer 30 to be determined or varied in accordance with the length of sheets which are desired to be cut.

The feed roll 18 is wider than the widest strip to be operated upon and is fast upon a shaft 64 which is journaled at its opposite ends in horizontal bearings in the brackets 44. There are two relatively narrow feed rolls 20 which are rigidly secured, in spaced relation, upon a shaft 66 that is journaled in horizontal bearings formed in the brackets 44. The peripheral portions of the rolls 20 are composed of rubber or other suitable material to frictionally grip and thus facilitate the feeding of the strip. The knife roll 24 is fast upon a shaft 68 while the bed roll 26 is mounted to turn freely upon a shaft 70. The shafts 68 and 70 are journaled at their ends in horizontal bearings formed in the brackets 44.

The knife 28 may be secured to the knife roll in any suitable manner. As shown, it is secured to a shoulder formed at one side of a peripheral notch 23, the shoulder being substantially tangential to the shaft 68. The knife, thus mounted, is also in substantially tangential relation to the shaft of the knife roll and consequently its cutting edge, which is serrated, as shown in Fig. 3, is presented substantially at right angles to the strip as it starts to cut. It has been found that there is less tendency for the teeth of the knife to tear the strip when the knife is presented to the strip as above set forth and consequently a cleaner cut is assured.

In accordance with the usual practice, the knife 28 is arranged to register with a groove 25, and an insert 27 of rubber or like material is provided for gripping the strip in advance of the knife so that the strip will be held taut between the point where it is gripped and the feed rolls 18 and 20 when the knife operates to sever a piece from the strip.

The conveyer rolls 36 are affixed, in spaced apart relation, upon a horizontal shaft 72 that is rotatable supported at its ends in the brackets 44. The roller 32 is carried by a curved arm 74 which is pivotally mounted upon the tie-rod 48. In the absence of a portion of a strip upon the conveyer, the roll 32 is held by its own weight and the weight of the arm 14 against an idle roller 35 which is located beneath it on the shaft 72. When the strip has been advanced beneath the roll 32, said roll serves to hold the strip against the conveyer belts. The tie-rod 48 also serves to support the strip-supporting fingers 22. For this purpose, the tie-rod 48 has affixed thereto a pair of depending brackets 73 (Fig. 1) and secured at its end to the brackets 73 is a horizontal transverse rod 75 to which the fingers 22 are affixed in spaced apart relation. The fingers 22 project through annular grooves 77 in the bed roll 26, as shown in Fig. 3, and extend from the feed roll 18 to the conveyor 30 so as to support the strip during its travel between these two points.

The described mechanism is adapted to derive its motion from a shaft 78 which may be the main driving shaft of the wrapping machine. The driving shaft 78 is connected, through a chain 80 and suitable sprockets, with a sleeve 82 which is mounted to turn upon a horizontal stud 84 and which is, in turn, connected through a chain 86 and suitable sprockets with one end of the shaft 70 upon which the bed roll 26 is mounted to turn. The feed rolls 18 and 20 are caused to rotate together by intermeshing gear wheels 88 and 90 which are secured to the shafts 64 and 66 respectively. During the operation of the mechanism, the feed rolls 18 and 20 are driven continuously from the shaft 70 by a changeable gear 92 secured to the latter shaft and an idler pinion 94 that is carried by a bracket 96 and intermeshes with the gears 92 and 88. The shaft 72 is driven by a sprocket chain 95 which passes over sprocket wheels on the shafts 72 and 64.

The knife roll 24 and the bed roll 26 are also geared together so as to rotate in unison by means of intermeshing gears 98 and 100, the former being secured to the shaft 68 and the latter being affixed to one end of the bed roll. The rolls 24 and 26 are driven from the shaft 70 through gearing hereinafter described, this gearing, together with the driving connections between the shaft 20 and the wrapping machine, being constructed to effect a single revolution of the knife roll for each cycle of operations of the wrapping machine.

It will now be seen that the length of the sheets cut by the knife 28 will be determined by the ratio of gearing between the feed rolls 18 and 20 and the shaft 70 inasmuch as said ratio determines the peripheral speed of the feed rolls and consequently the length of strip which will be fed past the point of cutting between successive cutting operations. Consequently to adapt the mechanism to cut sheets of a desired length, the changeable gear 92 is initially selected as to size so as to establish the proper ratio of the above mentioned gearing. If it is subsequently desired to adapt the mechanism to cut shorter sheets

the changeable gear 92 may be removed and another gear of a smaller size or diameter substituted therefor, thus decreasing the gear ratio between the shaft 70 and the feed rolls and causing the latter to measure off a shorter length of strip. Obviously the mechanism may be adjusted to cut longer sheets by replacing the changeable gear 92 with a gear of a greater diameter, thus increasing said gear ratio and causing the feed rolls to measure off a longer length of strip. To enable the gear 92 to be removed when it is desired to change the length of feed of the strip, means such as the set screw 93 (Fig. 2) is preferably provided for securing said gear to its shaft.

To permit the convenient assembly in the mechanism of the changeable gear 92, whatever the diameter of the latter may be, without the necessity of varying the diameter of the idler pinion 94 or making special provision for the mounting of its bearing stud, and to facilitate subsequent replacement of said gear 92 by an interchangeable gear of a different size, the bracket 96 is pivotally mounted upon the shaft 64 and is provided with an extension 102 which lies alongside of an ear 104 (Fig. 1) projecting from the adjacent bracket 44 of the frame 42. The idler bracket 96 is adapted to be rigidly secured to the ear 100 by means of a bolt 106, the shank of which extends through an arcuate slot 108 in the bracket extension 102 and is threaded into the ear 104, while the head of said bolt engages the face of said extension at opposite sides of the slot. The curvature of the slot 108 being concentric with the axis of the shaft 64, the bracket 102 may be readily swung about said shaft when the bolt 106 is loosened, thus enabling the idler pinion 94 to be rolled around the gear 88 until it is brought into mesh with the gear 92.

To insure the proper cutting action of the knife 28 it is desirable to have the knife travel at the same speed as the strip as the knife cuts through the latter. Inasmuch as the present mechanism is adapted to be set for the cutting of sheets of different lengths it is requisite that the knife be originally arranged to rotate during the cutting operation at the same speed as that of the advancing strip of stock, and that provision be made for varying the peripheral speed of the knife at the time of cutting in accordance with changes in the rate of feed of the stack.

In accordance with an important feature of the present invention, the knife roll 24 and the bed roll 26 are geared to rotate in unison and are driven by means of elliptical gears which cause said rolls to rotate at a variable speed during each cycle of operation of the mechanism. The elliptical gears are mounted with provision for radial adjustment to vary the time relation between any phase of said variable rotary movement and the time of the cutting operation to permit the peripheral speed of the knife at the time of cutting to be varied.

With the above ends in view, an elliptical gear 110 (Figs. 2 and 5) is affixed to the bed roll shaft 70, beside the changeable gear 92, and said gear 110 intermeshes with a similar elliptical gear 112 which is affixed to the knife roll shaft 70. Thus the knife roll 24 and the bed roll 26, which are geared together by the gears 98 and 100 as hereinbefore explained, are driven at a variable speed through each revolution by means of the elliptical gears 110 and 112.

To permit radial adjustment of the elliptical gears on their shafts and thereby to enable the speed of the knife at the time of the cutting operation to be varied, the gears 110 and 112 are provided with split hubs which are adapted to be adjustably secured to their respective shafts by means of binding screws 114. By loosening the bolts 114, the elliptical gears are free to be adjusted radially to effect the desired change of phase in the variable rotary movements of the knife roll and bed roll and thus to change the speed of the knife and the cooperating groove 25 in the bed roll at the time the cutting occurs.

It will be seen that by reason of the above described construction and arrangement of parts of the present mechanism and the provision of a plurality of interchangeable gears of different sizes adapted for attachment to the shaft 70 as the gear 92, the mechanism may be initially set up to cuts sheets of various lengths, within the limits for which the mechanism is designed, by selectively using the interchangeable gears, varying the radial position of the idler bracket 102 in accordance with the size of the particular interchangeable gear employed, locating the frame 42 upon supporting rods 52 so as to provide a conveyor of requisite length to handle and deliver the cut sheets and adjusting the elliptical gears radially upon their shafts to properly determine the speed of the knife and of the groove in the bed roll. Subsequent adjustments of the mechanism for varying the length of the sheets to be cut may be readily effected by removing the gear 92 and replacing it by another gear of a different size, throwing the idler pinion 94 into mesh with the new interchangeable gear by manipulation of the idler bracket 102, readjusting the elliptical gears, and shifting the frame 42 on the rods 52 toward or from the wrapping machine to shorten or lengthen the conveyer 30. In no case will it be necessary to remove and replace more than a single part, namely, the gear 92.

It is obvious that when assembling the

parts of the mechanism, a knife roll and a bed roll could be selected of such diameter that by securing the bed roll to the shaft 70 and gearing the rolls 24 and 26 together so as to rotate in unison, the knife 28 and the groove 25 could be made to rotate constantly at a speed equal to the rate of feed of the knife roll, and further, that the speed of the knife roll and bed roll could be varied in accordance with changes in the rate of feed of the strip by removing said rolls, together with the gears connecting them, and substituting therefor other rolls and gears of larger or smaller diameters. By reason of the above described use of the adjustably mounted elliptical gears, however, rolls of a standard size may be employed, irrespective of the rate at which the strip is to be fed to produce sheets of a particular length, and the mechanism may be conveniently adjusted to vary the length of the sheets cut thereby without the necessity of removing any parts and replacing them with other parts of different sizes.

The elliptical gears 110 and 112 are preferably so adjusted that the knife will operate to cut the strip while the speed of rotation of the knife is increasing. As a result, the speed of the knife will accelerate immediately after the cutting occurs and the knife will be quickly withdrawn from the path of the strip so that it will not obstruct the further progress of the strip.

The invention has been described for illustrative purposes in an embodiment at present preferred but the scope of the invention is determined by the appended claims rather than by the foregoing description.

What is claimed is:

Claims:

1. In a mechanism of the class described, a drive shaft, a knife roll and a bed roll arranged to receive a strip of paper therebetween, the bed roll being provided with a knife receiving slot, a knife carried by the knife roll disposed tangentially thereof for severing pieces from the strip, mechanism for advancing a strip to the said rolls, means connecting the drive shaft and advancing means for driving the latter continuously, means connecting the knife roll and bed roll for driving the same in unison, elliptical gears connecting the knife roll and drive shaft that are arranged for unlimited adjustment angularly of their respective shafts whereby the knife and bed roll may be driven at a variable speed with respect to the advancing mechanism.

2. In a mechanism of the character described, a knife roll and a bed roll arranged to permit a strip of stock to be fed freely between them, a knife carried by the knife roll for cooperating with a peripheral groove in the bed roll to sever a piece from the strip, feed mechanism for continuously advancing a strip of stock between said rolls, said mechanism being capable of adjustment by the removal of one of its parts and the substitution therefor of a corresponding part of a different size to enable the knife to cut pieces of a different length from the strip, means for rotating said rolls in unison and in timed relation with the feed mechanism to effect the severing of a piece of predetermined length from the strip at each revolution of the knife roll, and a conveyer for removing the severed pieces and delivering them, said conveyer being constructed and arranged to permit adjustment of its length to enable it to handle pieces of different lengths.

3. In a mechanism of the character described, a rotary knife, feed rolls for advancing a strip of stock into the field of operations of the knife, a continuously driven shaft, connections between said shaft and said knife for continuously rotating the latter, intermeshing gears severally connected to rotate with said feed rolls, one of a plurality of interchangeable gears of different diameters removably affixed to said shaft, an idler pinion for transmitting motion from said interchangeable gear to one of said intermeshing gears, a bracket carrying said pinion and mounted for oscillatory adjustment about the axis of said last named gear and means for rigidly securing said bracket in adjusted position.

4. In a mechanism of the character described, a knife roll, a knife carried thereby, a continuously driven shaft, a bed roll loosely mounted on said shaft, said bed roll being geared to rotate in unison with the knife roll and having a peripheral groove for cooperating with said knife to sever a strip fed between said rolls, feed means for continuously advancing a strip of stock between said rolls, driving mechanism for the feed means including a continuously driven gear mounted upon said shaft and adapted to be replaced by another gear of a different size to vary the rate of feed and the length of the pieces cut by the knife, a shaft upon which the knife roll is secured, an elliptical gear secured to said shaft, a second elliptical gear affixed to said continuously driven shaft cooperatively engaging the first elliptical gear, said elliptical gears being mounted upon their respective shafts with provision for radial adjustment thereon to vary the speed of the knife at the time of the cutting operation in accordance with variations in the rate of feed of the strip of stock.

5. In a mechanism of the character described, a continuously driven shaft, one of a plurality of interchangeable gears of different diameters detachably secured upon said shaft, a pair of cooperating feed rolls, means including an idle pinion intermeshing with said gear for rotating said rolls in unison to

advance a strip of stock, a bracket constructed and arranged to support said pinion with provision for oscillatory adjustment about the axis of one of said feed rolls to accommodate any of said interchangeable gears, whereby the feed rolls may be adapted to advance the stock at different rates of speed by selectively using said gears and adjusting said bracket, a knife roll and cooperating bed roll between which the strip is fed, a knife on the knife roll for cutting pieces from the strip, a conveyer for removing the cut pieces, and means driven from said shaft for rotating the knife roll and the bed roll in unison and for driving the conveyer.

6. In a mechanism of the character described, a frame adapted to be removably secured to a machine to which said mechanism is to be applied as an attachment, a second frame adjustable relatively to the first frame, means mounted upon the adjustable frame for feeding a continuous strip of material and for cutting it into sheets as it is fed, said means being capable of adjustment by removal of one of its component parts and the substitution therefor of a corresponding part of a different size to enable the mechanism to cut sheets of a different length from the strip, a conveyer belt for removing the pieces as they are cut, and means for supporting said belt and for varying its length as the second frame is adjusted relatively to the first frame, said means comprising a roller carried by the first frame for supporting one end of the conveyer, a second roller carried by the second frame for supporting the opposite end of the conveyer, and a belt tightening device for maintaining the upper stretch of the belt taut between said rollers in all adjusted positions of the second frame.

7. In a mechanism of the character described, a frame adapted to be removably secured to a machine to which said mechanism is to be applied as an attachment, a pair of supporting rods projecting horizontally from said frame, a second frame mounted for sliding adjustment upon said rods, means for securing the second frame in adjusted position upon said rods, means mounted upon the adjustable frame for feeding a continuous strip of stock and for cutting the strip into pieces as it is fed, said means being capable of adjustment by removal of one of its component parts and the substitution therefor of a corresponding part of a different size to adapt the mechanism to cut pieces of a different length from the strip, and an endless belt conveyer for removing the pieces as they are cut, said conveyer having a roller carried by the first frame for supporting the conveyer belt at the delivery end of the conveyer and a second roller carried by the adjustable frame for supporting the conveyer belt at the receiving end of the conveyer whereby the length of the conveyer may be varied in accordance with variation in the length of the cut pieces by adjustment of the second frame upon its supporting rods.

8. In a mechanism of the character described, a frame adapted to be removably secured to a machine to which said mechanism is to be applied as an attachment, a second frame adjustable relatively to the first frame, means mounted upon the adjustable frame for feeding a continuous strip of material and for cutting it into sheets as it is fed, said means being capable of adjustment by removal of one of its component parts and the substitution therefor of a corresponding part of a different size to enable the mechanism to cut sheets of a different length from the strip, a conveyer comprising an endless belt passing over a roller carried by the first frame and over a second roller carried by the adjustable frame whereby the length of the conveyer may be varied in accordance with variation in the length of the cut pieces by adjustment of the second frame, means for driving one of said rollers in unison with said strip feeding means to advance the conveyer to remove the pieces cut by the knife, and a belt tightener for taking up the slack in the lower stretch of the conveyer belt.

9. In a mechanism of the character described, a frame adapted to be removably secured to a machine to which said mechanism is to be applied as an attachment, a second frame adjustable relatively to the first frame, means mounted upon the adjustable frame for feeding a continuous strip of material and for cutting it into sheets as it is fed, said means being capable of adjustment by removal of one of its component parts and the substitution therefor of a corresponding part of a different size to enable the mechanism to cut sheets of a different length from the strip, a conveyer comprising an endless belt passing over a roller carried by the first frame and over a second roller carried by the adjustable frame whereby the length of the conveyer may be varied in accordance with variation in the length of the cut pieces by adjustment of the second frame, means for driving one of said rollers to advance the conveyer to remove the pieces cut by the knife, and an idle roll carried by the adjustable frame and located above the receiving end of the conveyer for engaging the upper face of a piece of stock as it reaches the conveyer and cooperating with the conveyer to advance the stock.

10. In a mechanism of the character described, a knife roll and a bed roll arranged to receive a strip of stock therebetween, the bed roll being provided with a knife receiving slot a knife carried by said knife roll that is disposed tangentially of

the shaft of said roll, adjustable means for advancing a strip of stock between the said rolls at various lineal speeds, gears carried by said rolls whereby they are operated in unison, elliptical gears associated with said rolls and advancing means that are arranged for unlimited adjustment with respect to the said rolls, whereby the said rolls may be driven at a speed corresponding to the feeding speed when the knife and slot thereof are aligned during their cutting operation.

In testimony whereof I have affixed my signature.

ELMER LOVELL SMITH.