L. C. PALMER & H. CARLE.

CUTTING AND FEEDING MECHANISM.

APPLICATION FILED DEC. 10, 1914.

1,179,960.

Patented Apr. 18, 1916.

2 SHEETS—SHEET 1.

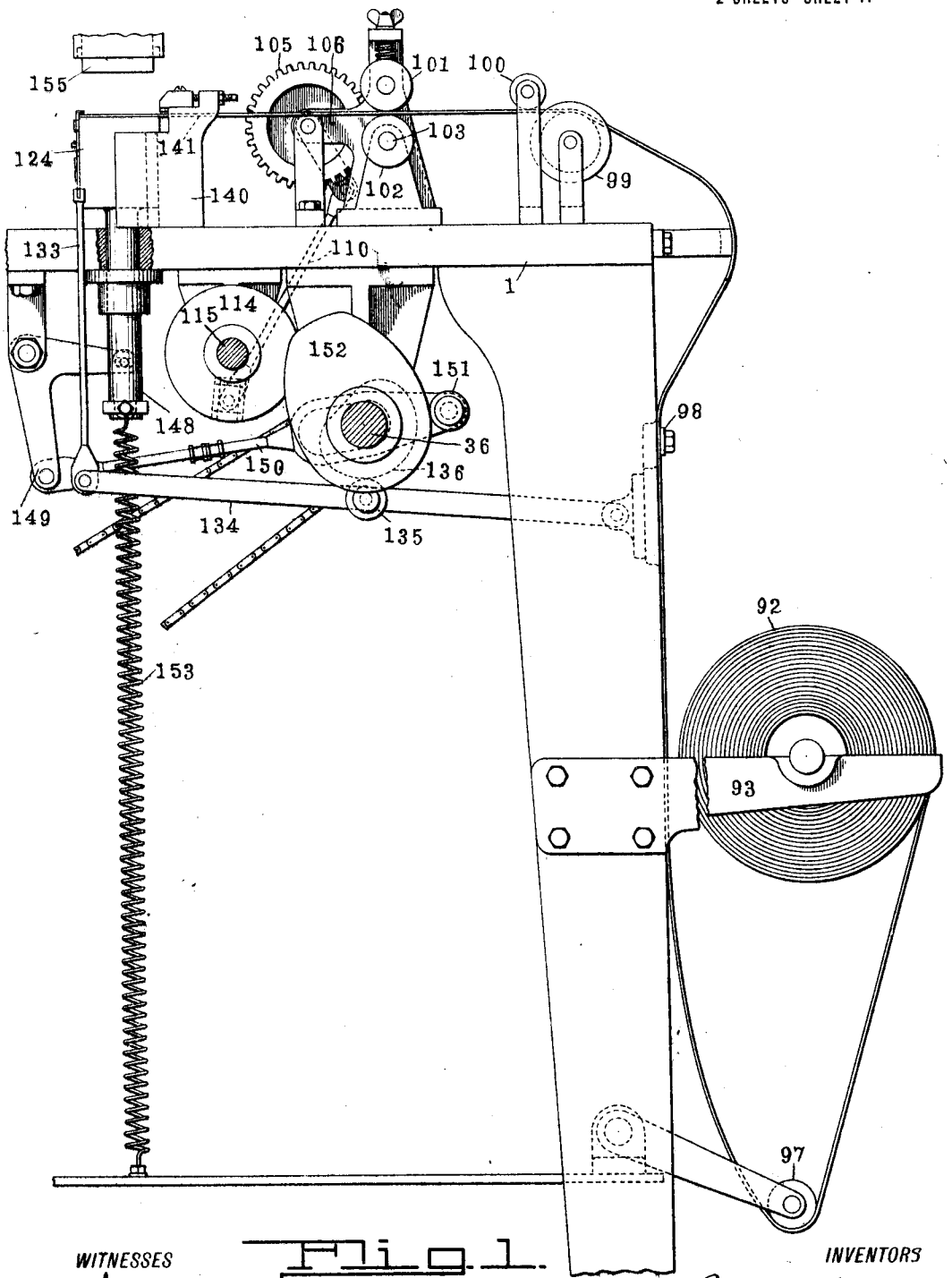

Fig. 1.

WITNESSES

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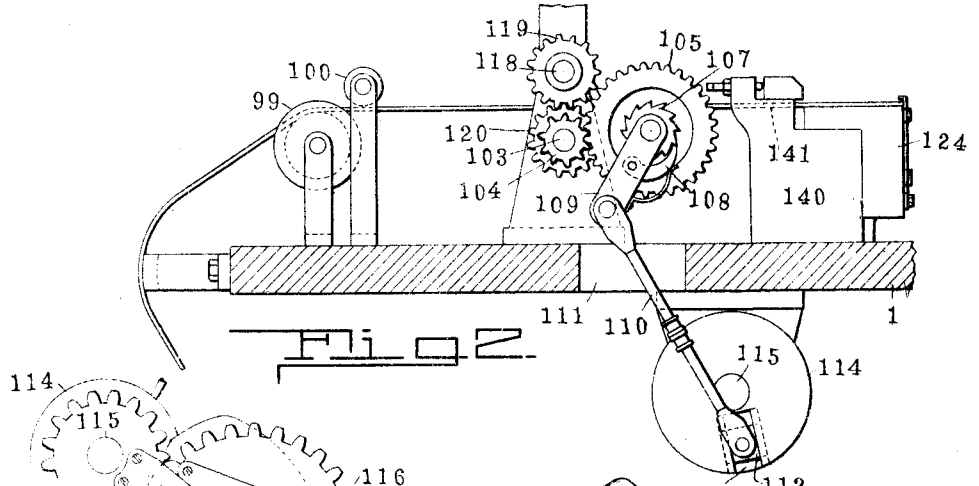

Fig. 2.

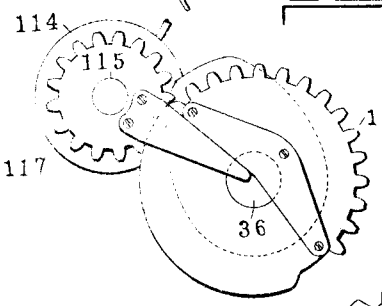

Fig. 4.

Fig. 3.

WITNESSES

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UNITED STATES PATENT OFFICE.

LYNDON C. PALMER AND HAROLD CARLE, OF BUFFALO, NEW YORK, ASSIGNORS TO F. N. BURT COMPANY, LIMITED, OF BUFFALO, NEW YORK, A CORPORATION OF ONTARIO, CANADA.

CUTTING AND FEEDING MECHANISM.

1,179,960. Specification of Letters Patent. **Patented Apr. 18, 1916.**

Original application filed July 9, 1914, Serial No. 849,869. Divided and this application filed December 10, 1914. Serial No. 876,414.

To all whom it may concern:

Be it known that we, LYNDON C. PALMER, a citizen of the United States, and HAROLD CARLE, a citizen of Canada and subject of the King of England, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Cutting and Feeding Mechanism, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to apparatus for severing blanks from webs of paper and similar material, and with respect to its more specific features, to apparatus of the character referred to in which the web is fed automatically and the severed blanks are automatically moved away from the position in which they were severed.

One of the objects of the invention is the provision of a simple and practical device of the character described.

Another object of the invention is the provision of an efficient apparatus for severing blanks from a roll of relatively heavy paper stock.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings illustrating one embodiment of the invention and wherein similar reference characters refer to similar parts throughout the several views, Figure 1 is a side elevation of a portion of a machine in which the invention may be embodied; Fig. 2 is a side view of a portion of the apparatus looking at the opposite side of Fig. 1; Fig. 3 is a perspective detailed view of a portion of the apparatus; and Fig. 4 is a detail of certain transmission mechanism employed.

The invention herein referred to is particularly adapted to be employed in connection with automatic machinery for the manufacture of paper boxes involving rectangular shells or tubes, such, for instance, as is disclosed in applicants' co-pending application filed July 9, 1914, Serial No. 849,869, of which this application is a division.

When using the automatic machine referred to, a roll or coil of relatively thick paper forms a supply of body web which is suitably folded in the machine so as to be acted upon by the different elements, and so that the blanks are successively severed from the end of the web, which blanks are subsequently to be assembled with covering material and thereafter folded into rectangular shells or tubes. A suitable supply of body web may be mounted in roll form, as shown at 92, on a bracket 93 extending from the frame. The blanks cut from this web are preferably of relatively heavy stock, such as pasteboard, strawboard, cardboard, etc. The body web is longitudinally scored along lines on which the severed blanks may be folded, the scoring preferably comprising grooves which are formed by removing the material of the web, as by means of scoring rollers which abrade the surface of the web and thus form said grooves. In the present instance, three grooves 94, 95 and 96 are provided.

From the supply roll 92 the body web passes beneath a guide roller 97, thence upwardly beneath a tension plate 98, thence over a flanged guide roller 99, and beneath a coöperative keeper roller 100 supported on the upper surface of the table 1. The web then passes between two feed rollers 101 and 102, one above and the other below the web, which rollers may have roughened or knurled surfaces and are adapted to grip and feed the web intermittently as they are rotated. The lower roller 102 is carried by a shaft 103 having a pinion 104 meshing with a gear 105 supported in a bracket bearing 106, the gear 105 being intermittently rotated in one direction by means of a ratchet wheel 107 and a pawl 108 pivotally connected to a rock arm 109, in turn pivoted on the stud shaft supporting the gear 105, the arm 109 being rocked by a link 110 passing through a slot 111 in the table 1, and pivotally connected to a block 112 adjustably mounted in a radial slot 113 in a crank disk 114 fast to a short horizontal shaft 115 supported in a bracket beneath the table 1, said crank disk

114 being driven from a cam shaft 36 by a segment gear 116 on said cam shaft meshing with a segment pinion 117 on the horizontal shaft 115, said gear and pinion being provided with proper starting teeth. In the present embodiment the cam shaft 36 is continuously driven and operates as the driving shaft of the machine. The proportions and the relative number of teeth of the gear 116 and the pinion 117 are such as to cause the pawl 108, on each feeding operation, to rotate the feed roller 102 an amount sufficient to feed or advance the body web the proper predetermined distance equal to the length of blank to be produced. The upper feed roller 101 is carried by a shaft 118 having a pinion 119 meshing with a pinion 120 of equal size, on the shaft carrying pinion 104. In this manner the upper roller 101 will be rotated at the same speed as the lower roller 102. The shaft 118 loosely bears in the bracket 106 so as to permit the roller 101 to have some movement toward and from the roller 102, and the roller 101 is pressed toward the roller 102 by a spring 121 surrounding a pin 122 upstanding from a block 123 in which the shaft 118 bears. The gear 116 and the pinion 117 are locked in positions of rest by the usual intervening smooth peripheral portions of said respective gears.

To positively limit the advance or feed of the body web and thereby accurately position the advance edge of the body blank to be severed from said web, stops are disposed in the path of said web.

The numeral 124 indicates a vertically reciprocatory body blank support, preferably a carriage which also serves as one element of the web severing or cutting mechanism, the rear edge 125 of said carrier being squared off to form a cutting edge, cutter, or knife, transversely of the web. At the end of the reciprocatory carriage 124 are disposed a plurality of stops and web holding devices comprising vertically reciprocatory plates, or stops, 126 in the path of the web having flanges 127, said flanges providing gripper jaws adapted to coöperate with the upper surface of the carriage 124 to hold the web during the cutting operation and to retain the body blank on the carriage during certain subsequent operations. These jaws are simultaneously raised or lifted from the upper surface of the carriage 124 by rock levers 128 and 129 fulcrumed on an outer face of the carriage 124, one of the arms of each of said rock levers being rounded as at 130 and disposed to have a sliding of cam engagement with the lower ends of the plates 126. The operating mechanism of the levers 128 and 129 comprises a link 131 whereby the motion of one lever is duplicated by the other; and the lever 129 has an arm 132 joined by a connecting rod 133 to a rock lever 134 pivoted on the frame and carrying a cam roller 135 coöperating with a cam 136 on the cam shaft 36. The plates 126 are positively raised by the cam operating mechanism and are lowered by gravity assisted by the spring 137 coiled around a pin 138, the opposite end of said spring engaging pins 139 on plates 126.

Upstanding from the table 1 is a frame piece or block 140 which is horizontally slotted as at 141 to permit the passage of the body web, and the dimension of this slot widthwise of the web may correspond exactly to the width of the web and hence serve as a guide for said web. On a shoulder 142 of the piece 140 is disposed a relatively stationary cutting blade or knife 143, having slots 144 through which pass cap screws 145. Adjusting pins 146 extend through an upwardly extending flange 147 of the piece 140 and are adapted to abut the side wall of the knife 143. By this construction the knife 143 may be nicely adjusted into position at right angles to the side edges of the web and relatively with the cutting edge 125 comprised in the movable piece 140. The body blank carriage 124 is supported at the upper end of a substantially depending stem or tubular guide rod 148 extending through a guide opening in the table 1 and vertically moved through the instrumentality of a bell crank lever 149, one arm of which has a pin and slot engagement with the stem 148 and the other arm of which is pivotally connected to an adjustable rod 150 having a follower comprising a cam roller 151 coöperating with a peripheral cam 152 on the cam shaft 36. A spring 153 connects the stem 148 and the frame and assists in lowering said frame.

In operation, the web is threaded in the machine as before explained, and the shaft 36 is rotated by any suitable means. The rollers 101 and 102 will be rotated in the direction to advance the web between the cutters 125 and 143, its foremost end being fed into position opposite the carriage 124. The web having been fed, relative movement between the cutters will follow, the carriage 124 rising and moving in a direction across the plane of the web, the cutting edge 125 coöperating with cutter 143 to sever the web. The jaws 127 will hold the web on the carriage 124 during the cutting operation and thereafter until a predetermined point is reached by the carriage, whereupon the jaws 127 will release their grip on the severed section, permitting the section, or blank, to be removed from the carriage or otherwise operated upon as desired. After the removal of the blank, the carriage will descend, and the web will be again fed, whereupon the foregoing operations are repeated. Thus by the above described construction

are accomplished, among others, the objects hereinbefore stated.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention, which, as a matter of language, might be said to fall therebetween.

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

1. In an apparatus of the character described, in combination, a movable web support comprising a cutter, a second cutter, means adapted to intermittently feed a web between said cutters, means adapted to cause relative movement between said cutters so as to sever said web, and means movable with said support adapted to hold a portion of said web on said support while being severed.

2. In an apparatus of the character described, in combination, a movable web support comprising a cutter, a second cutter, means adapted to intermittently feed a web between said cutters, means adapted to cause relative movement between said cutters so as to sever said web, means movable with said support adapted to be interposed in front of the end of the web to limit the extent of feed thereof, and means adapted to hold a portion of said web on said support while being severed.

3. In an apparatus of the character described, in combination, a web section supporting carriage comprising a knife, a second knife, means adapted to intermittently feed a web between said knives into position opposite said carriage, and means adapted to move said carriage so as to effect severing of said web by said knives.

4. In an apparatus of the character described, in combination, a carriage comprising a knife, a second knife, means adapted to intermittently feed a web between said knives into position opposite said carriage, and means adapted to move said carriage in a direction across the plane of said web so as to effect severing of said web by said knives.

5. In an apparatus of the character described, in combination, a carriage comprising a knife, a second knife, means adapted to intermittently feed a web between said knives onto said carriage, means adapted to move said carriage in a direction across the plane of said web so as to effect severing of said web by said knives, and means adapted to hold said web on said carriage while being severed.

6. In an apparatus of the character described, in combination, a carriage comprising a knife, a second knife, means adapted to intermittently feed a web between said knives onto said carriage, means adapted to move said carriage in a direction across the plane of said web so as to effect severing of said web by said knives, and means adapted to hold said web on said carriage while being severed, comprising a gripper jaw movable toward and from said carriage.

7. In an apparatus of the character described, in combination, a carriage comprising a knife, a second knife, means adapted to intermittently feed a web between said knives onto said carriage, means adapted to move said carriage in a direction across the plane of said web so as to effect severing of said web by said knives, and means adapted to hold said web on said carriage while being severed, comprising a gripper jaw movable toward and from said carriage, said holding means carrying a stop adapted to be disposed in the path of said web.

8. In an apparatus of the character described, in combination, a carriage comprising a knife, a second knife, means adapted to intermittently feed a web between said knives onto said carriage, means adapted to move said carriage in a direction across the plane of said web so as to effect severing of said web by said knives, means adapted to hold said web on said carriage while being severed, comprising a gripper jaw movable toward and from said carriage, means adapted to positively move said jaw away from said carriage, and resilient means tending to urge said jaw toward said carriage.

9. In an apparatus of the character described, in combination, a carriage comprising a knife, a second knife, means adapted to intermittently feed a web between said knives onto said carriage, means adapted to move said carriage in a direction across the plane of said web so as to effect severing of said web by said knives, a gripper jaw mounted on said carriage, and means adapted to move said jaw toward and from said carriage.

10. In an apparatus of the character described, in combination, a carriage comprising a knife, a second knife, means adapted to intermittently feed a web between said knives onto said carriage, means adapted to move said carriage in a direction across the plane of said web so as to effect severing of said web by said knives, a gripper jaw mounted on said carriage, and means adapted to move said jaw toward and from said carriage comprising a rock lever ful-

crumed on said carriage, and means to rock said lever.

11. In an apparatus of the character described, in combination, a carriage comprising a knife, a second knife, means adapted to intermittently feed a web between said knives onto said carriage, means adapted to move said carriage in a direction across the plane of said web so as to effect severing of said web by said knives, a plurality of gripper jaws mounted on said carriage, and means adapted to move said jaws toward and from said carriage, comprising a plurality of rock levers fulcrumed on said carriage and means simultaneously to rock said levers.

12. In an apparatus of the character described, in combination, a carriage comprising a knife, a stationary knife, means adapted to intermittently feed a web between said knives onto said carriage, a guide stem supporting said carriage, and means adapted to reciprocate said carriage past said stationary knife, comprising a lever operatively connected to said stem.

13. In an apparatus of the character described, in combination, a carriage comprising a knife, a stationary knife, means adapted to intermittently feed a web between said knives onto said carriage, a guide stem supporting said carriage, means adapted to reciprocate said carriage past said stationary knife, comprising a lever operatively connected to said stem, a gripper jaw movably mounted on said carriage, and means adapted to move said jaw toward and from said carriage, comprising a rock lever fulcrumed on said carriage.

In testimony whereof we affix our signatures, in the presence of two witnesses.

LYNDON C. PALMER.
HAROLD CARLE.

Witnesses:
HAROLD C. COPPINS,
CARL N. SNYDER.