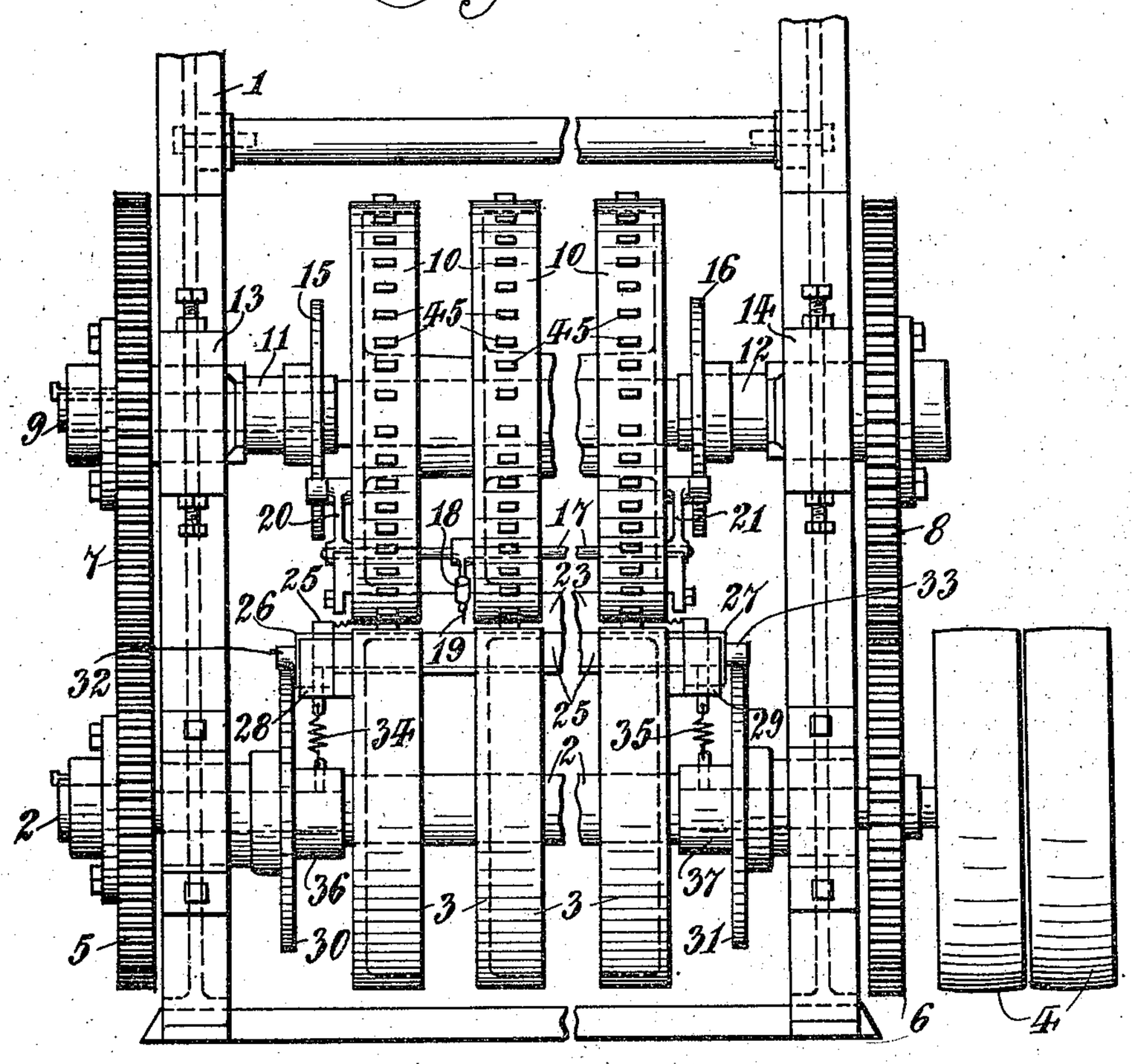
June 19, 1923. 1,459,041

H. G. WIDMER

MACHINE FOR OPERATING ON PAPER

Filed May 4, 1918 2 Sheets-Sheet 1

Fig. 1.



WITNESS

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Fig. 2.

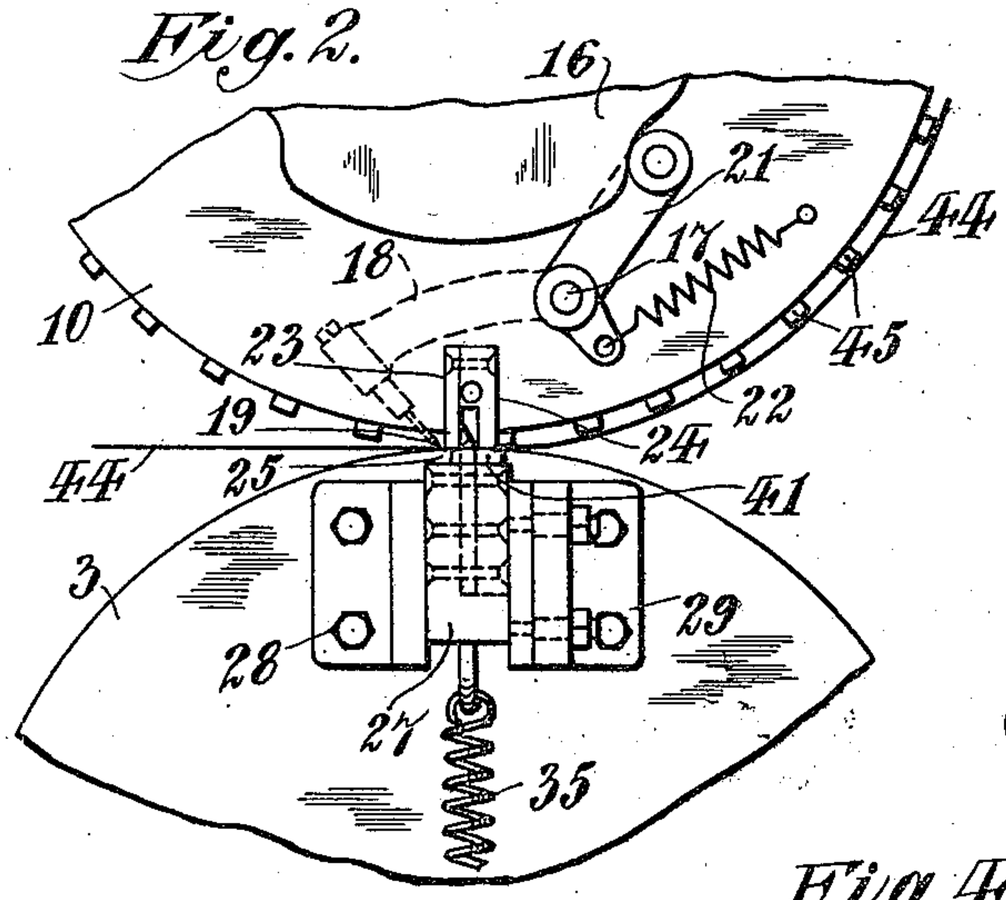


Fig. 3.

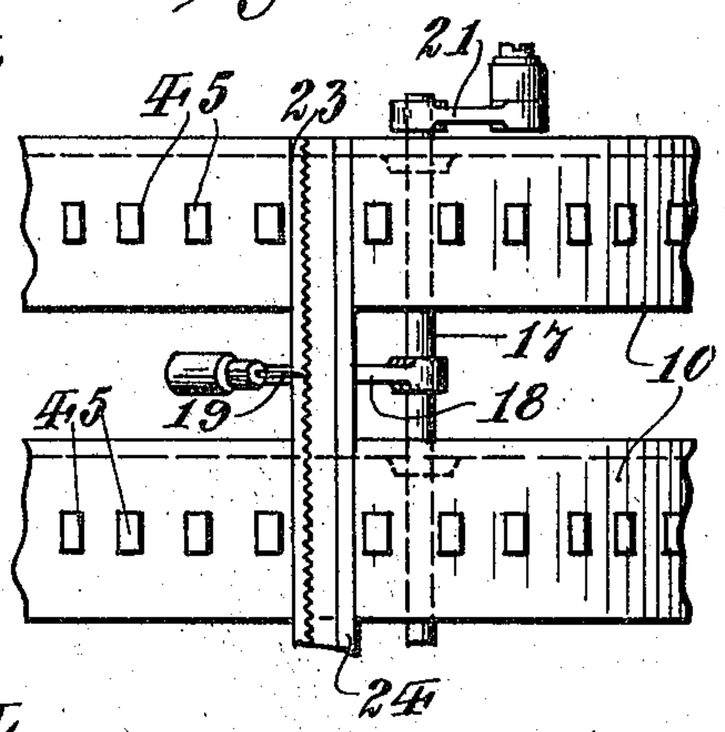


Fig. 4.

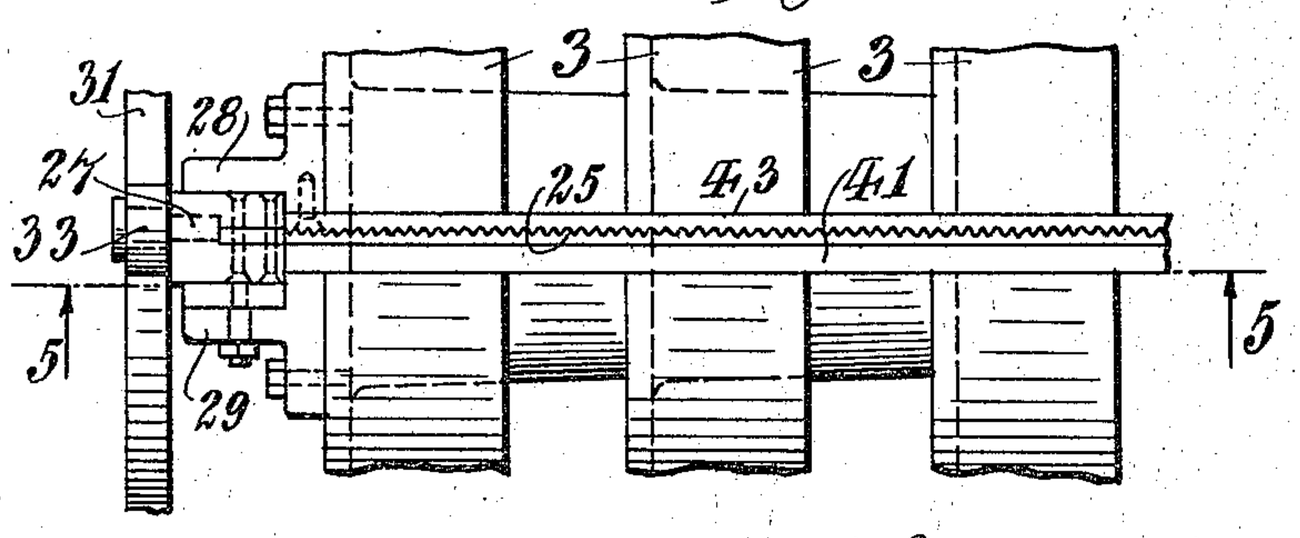


Fig. 5.

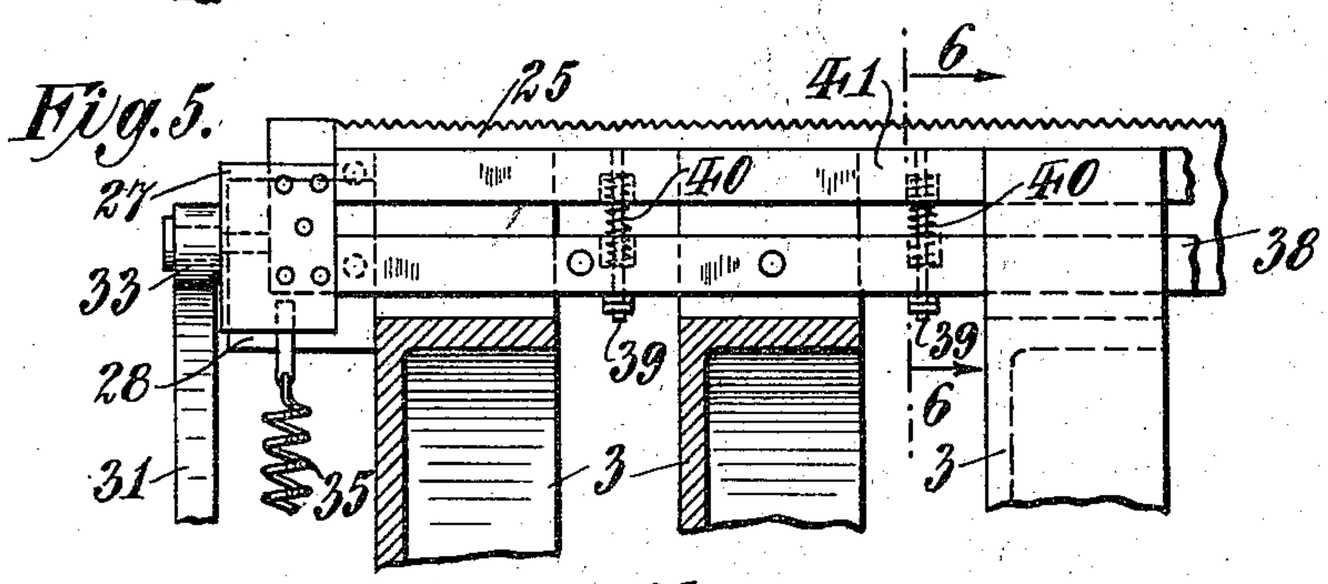
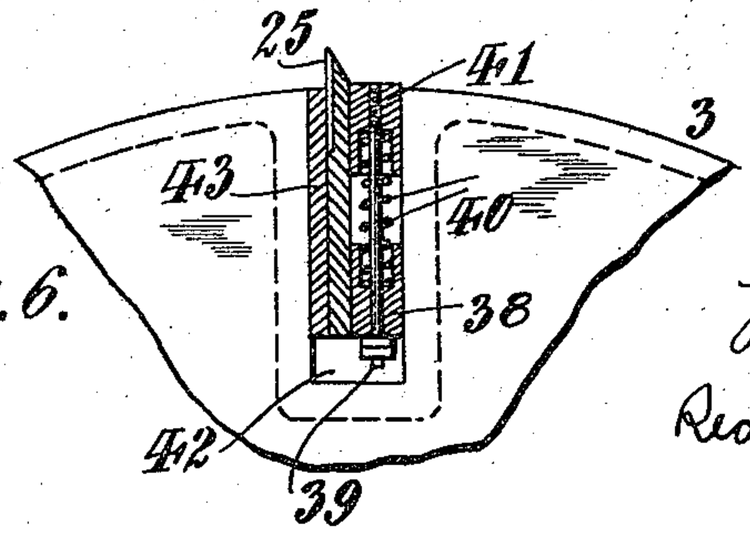


Fig. 6.



WITNESS

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his ATTORNEYS

Patented June 19, 1923. 1,459,041

UNITED STATES PATENT OFFICE.

HOWARD G. WIDMER, OF BROOKLYN, NEW YORK, ASSIGNOR TO ARKELL SAFETY BAG COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

MACHINE FOR OPERATING ON PAPER.

Application filed May 4, 1918. Serial No. 232,606.

To all whom it may concern:

Be it known that I, HOWARD G. WIDMER, a citizen of the United States, and a resident of the borough of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Machines for Operating on Paper.

The invention seeks more particularly to provide means whereby a web of paper may be fed continuously and cut off in sheets designed to be thereafter folded and formed into tubes. The invention is especially designed to work upon crinkled paper and it consists of the various features and their arrangement and combination hereinafter pointed out.

In the accompanying drawings forming part of this specification, and in which like reference numerals designate corresponding parts, the invention and its various features are shown in the preferred form.

In the drawings,

Fig. 1 is a front elevation showing rolls for feeding and cutting the paper, between which the paper passes, parts being broken away.

Fig. 2 is an end elevation of portions of the feed and cutting rolls and showing the cutting mechanism associated therewith.

Fig. 3 is a plan view of the upper feed roll shown in Fig. 2 looking from beneath.

Fig. 4 is a plan view of the lower roll shown in Fig. 2 and showing the cutting knife carried by said roll.

Fig. 5 is a sectional elevation taken on the line 5—5 of Fig. 4.

Fig. 6 is a sectional elevation taken on the line 6—6 of Fig. 5.

Referring now to the particular structure shown in the drawings, 1 is the main frame of the machine in which is mounted a shaft 2 carrying the roll 3. This roll is suitably driven as from the pulleys 4. Fixed on shaft 2 are gear wheels 5 and 6 which mesh with and drive gear wheels 7 and 8 fixed on shaft 9 mounted in the main frame. The roll 10 is fixed on shaft 9. Surrounding the shaft 9 at its ends are two sleeves 11 and 12 which are fixed against rotation in the boxes 13 and 14 surrounding the shaft. On these sleeves 11 and 12 are two stationary cams 15 and 16. 17 is a rock shaft mounted in the roll 10 and carrying a series of arms 18 provided with pins 19 at their outer ends. The ends of the rock shaft 17 are provided with fixed arms 20 and 21 having rollers at their outer ends which ride on the cams 15 and 16. A spring 22, having one end secured to a lug on the shaft and the other end secured to the roll 10, serves to keep the arms 20 and 21 in contact with their cams 15 and 16. Fixed radially in the periphery of the roll 10 is a knife 23 having a serrated cutting edge. Also fixed radially in the periphery of the roll 10 is a bar 24 separated a short distance from the knife 23 so as to provide a channel between it and the knife.

Moving radially in a slot formed in the periphery of the roll 3 is a knife 25 having a serrated beveled edge. This knife is riveted at its ends to blocks 26 and 27 which, together with the knife 25, are arranged to reciprocate between pairs of guide brackets 28 and 29 fixed on the opposite ends of the roll 3. Radial movement is imparted to the knife by cams 30 and 31 which engage the rollers 32 and 33 fixed on the blocks 26 and 27, respectively. Springs 34 and 35 keep these rollers in contact with their cams. These springs are connected at one end to the blocks and at their other ends to sleeves 36 and 37 fixed in the boxes supporting the shaft 2 of roll 3. Cams 30 and 31 are fixed on these stationary sleeves. Riveted to the lower margin of the knife 25 is a bar 38 through which loosely pass the parallel with the knife a series of bolts 39 surrounded by springs 40 and at their upper end screwed into a bar 41 lying close against the knife and whose upper surface projects slightly above the surface of the roll 3. The springs 40 fit in recesses in the bars 38 and 41. These bars and the knife are located in a radial recess 42 formed in the periphery of the roll 3. On the side of the knife 25 opposite to the bars 38 and 41 is another bar 43 which is fixed in the recess 42 and forms a guide for the knife 25 in its reciprocating movement.

As shown in the drawings, rolls 3 and 10, instead of being formed with a continuous surface, are formed of separated narrow cylindrical sections, each of which is fixed securely on its shaft. This arrangement saves material and furthermore, in connection with roll 22, enables the arms 18 on rock shaft 17 to be mounted between the sections of that roll. One of the functions of these rolls 3 and 10 is to receive

between them and feed forward the web of paper 44 and, when such paper is crinkled, it is advantageous that at least one of these rolls be provided with teeth on its periphery. In the present instance, the upper roll 10 is provided with teeth 45. These teeth engage the paper and feed it forward reliably and uniformly to the knives 23 and 25 and without unduly stretching the paper which, because of its crinkles, is capable of stretching considerably. If both rolls were smooth faced, the feed of the crinkled paper would necessarily depend upon its frictional engagement by and between such smooth faced rolls and the crinkles would be injured and the paper unduly stretched. One of the rolls, as roll 3, may have a smooth surface as shown. In the operation of the rolls 3 and 10 and their knives, when a predetermined length of the paper web is passed between the rolls and just before the knives 23 and 25 come into alignment, bar 41, which projects slightly above the periphery of the roll 3, grips the paper between it and the cooperating bar 24 on roll 10, bar 41, owing to its spring mounting, yielding to the pressure put upon it by the bar 24. At substantially the same time, arms 20 and 21 pass beyond the elevated portions of their cooperating cams 15 and 16 and the spring 22 rocks the shaft 17 so as to throw the pins 19 forward and outward through the paper on a line just back of the knife 23. At substantially the same time rollers 32 and 33 of knife 25 pass on to the elevated portions of their cams 30 and 31, thereby moving knife 25 outward so as to sever the paper in cooperation with knife 23. As the rolls 3 and 10 continue their movement, the knife rollers 32 and 33 travel off of the elevated portions of their cams and knife 25 is retracted by its springs 34 and 35. At the same time the pins 19 carry the paper which they have engaged around the roll 22 and continue to thus engage the paper until the arms 20 and 21 have traveled slightly beyond three-quarters of a turn, when they rise up on the elevated portions of their cams and thereby retract the pins from engagement with the paper.

As the rolls continue their movement, the knives repeat their action to cut off another length of paper and the pins 39 repeat their action to engage a new length of paper just entering between the rolls. As each separate sheet of paper is released from the pins 19, it passes off from the roll 10 in the manner described in my pending application above referred to.

While the invention is shown in the drawings in what is believed to be its best form, it is to be noted that various changes in the form and arrangement of parts may be made without departing from the scope of the invention.

What I claim is:—

1. A cutting roll of a paper machine having a radial recess in its periphery; a knife reciprocating in said recess; and a paper holding bar carried yieldingly by said knife at its side in said recess.

2. In a machine for operating on paper, the combination of two rolls, cooperating fixed and reciprocating knives carried by said rolls for cutting paper passing between the rolls; and means carried by the rolls immediately in advance of the knives to engage and hold the paper while the knives are operating, said means comprising a bar fixedly carried by one roll and a second rigid bar yieldingly carried by the other roll and means to reciprocate one of the bars.

3. In a machine for operating on paper, the combination of two rolls, cooperating fixed and reciprocating knives carried by said rolls for cutting paper passing between the rolls; means carried by the rolls immediately in advance of the knives to engage and hold the paper while the knives are operating, said means comprising a bar fixedly carried by one roll and a second rigid bar yieldingly carried by the other roll and means to reciprocate one of the bars; and means carried by one of the rolls to engage the paper and carry it around on said roll after a preceding length of the paper has been cut off.

4. In a machine for operating upon crinkled paper, the combination of two co-operating rolls between which the paper is fed, each roll comprising cylindrical sections spaced apart and one of said rolls being provided with peripheral teeth; means for cutting off a length of the paper passing between the rolls; and means carried by one of said rolls and projecting between its cylindrical sections to engage the paper and carry it around on said roll after a preceding length of the paper has been cut off.

5. In a machine for operating on paper in the web, two rolls mounted on parallel axes, each of the rolls having a plurality of spaced apart sections juxtaposed for rolling contact with corresponding sections of the other roll, cooperative severing mechanism carried by the sections of each roll and bridging the gaps between the sections of that roll, and mechanism carried by the rolls for drawing the web of paper between the rolls.

6. In a machine for operating on paper, in combination, two co-operating rolls having provisions to draw a web of paper between them, one of the rolls comprising a plurality of spaced apart sections provided with peripheral teeth, and means carried by the rolls to sever the paper, said means comprising a bar bridging the gap between the sections, the outer edge of the bar and the ends of the teeth being in the same peripheral plane.

7. In a machine for operating on a web of paper, in combination, cooperating feed rolls having means to draw the paper between them, the rolls comprising a plurality of spaced apart cylindrical sections, and means associated with the sections and cooperating to completely sever the web transversely, said means comprising a relatively fixed cutting bar carried by the sections of one roll, a second cutting bar movably mounted in the sections of the other roll, and means to operate the movable bar, both of said bars bridging the gaps between the sections.

8. In a machine for operating on a web of paper, in combination, cooperating feed rolls having means to draw the paper between them, the rolls comprising short cylindrical sections, and means associated with the sections and cooperating to sever the web, said means comprising a relatively fixed cutting bar carried by the sections of one roll, a relatively movable cutting bar carried by the sections of the other roll, means to operate the movable bar, and an independently yieldable paper holding bar carried by the movable cutting bar to hold the severed sheet.

9. The combination with one of the feeding rolls of a paper handling machine of a severing knife guided for radial reciprocation in a channel in the roll and having yieldingly associated for bodily reciprocation therewith a paper holding bar adapted to extend beyond the periphery of the roll.

10. In a machine for operating upon crinkled paper, the combination of two cooperating rolls between which the paper is fed, each roll comprising cylindrical sections spaced apart, means for cutting off a length of the paper passing between the rolls, and means carried by one of said rolls and projecting between its cylindrical sections to engage the paper and carry it around on said roll after a preceding length of the paper has been cut off.

This specification signed this first day of May, A. D., 1918.

HOWARD G. WIDMER.