

April 9, 1929.

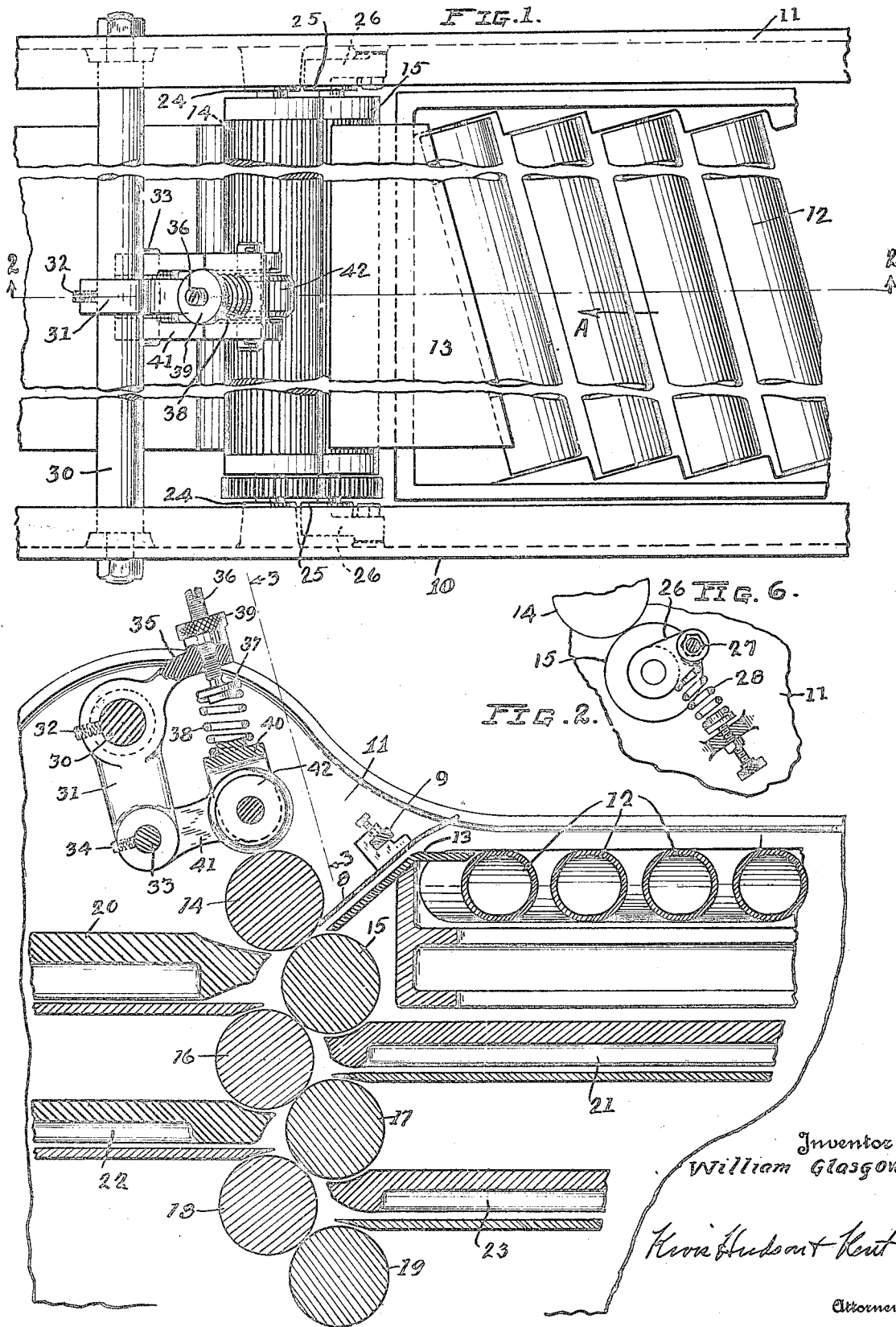
W. GLASGOW

1,707,979

PAPER HANDLING MACHINE

Filed June 16, 1927

2 Sheets-Sheet 1



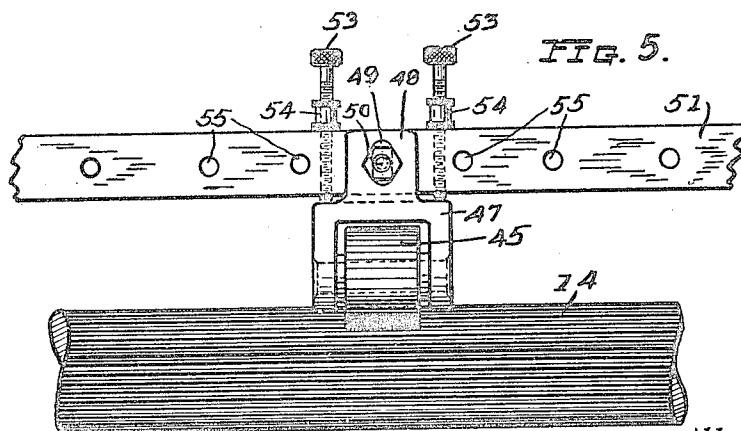
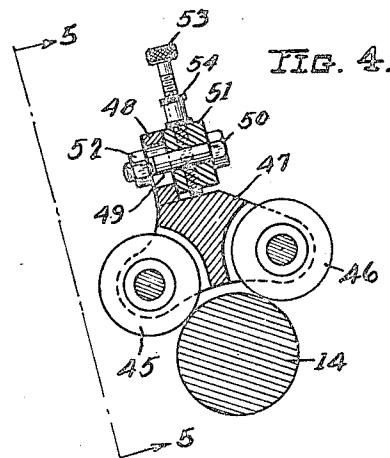
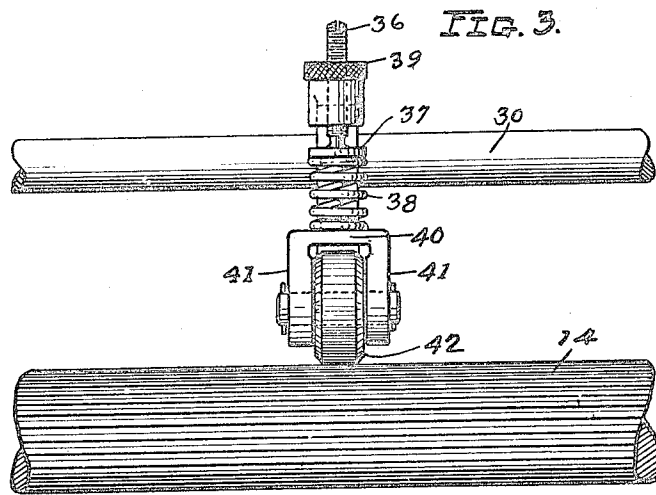
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

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PAPER-HANDLING MACHINE.

Application filed June 16, 1927. Serial No. 199,284.

This invention relates to improvements in paper handling machines, particularly such machines as employ relatively long paper feeding rolls.

Long rolls, supported only in the bearings at their ends, bow outwardly to a slight extent during rotation of the rolls. Whether this is due to a slight misplacement of the center of gravity of the roll with respect to its rotational axis or whether it is due to some other cause, I am not at present able to state. The condition is present, however, and affects the efficiency of the machine in which the rolls are incorporated, for, although this bowing is very slight indeed, nevertheless it is an important factor in the operation of the machine when single thicknesses of thin paper are being fed. At such times, the slightest variations in the contact pressure across the rolls unfavorably affects their operation.

The principal object of the invention, therefore, is to remove or to reduce as far as possible the bowing or deflection of the rolls during their rotation.

Other objects will appear as I proceed with the description of those embodiments of the invention which, for the purposes of the present application, I have illustrated in the accompanying drawings, in which:

Fig. 1 is a plan view of a portion of a folding machine embodying my invention, parts of the machine being cut away to reduce the width of the figure;

Fig. 2 is a vertical section taken substantially upon the line 2—2 of Fig. 1;

Fig. 3 is an elevational view looking in the direction of arrows 3 of Fig. 2;

Fig. 4 is a cross-sectional view showing a modification;

Fig. 5 is a view similar to that of Fig. 3 but showing the modification of Fig. 4, the view being taken in the direction of arrows 5 of Fig. 4; and

Fig. 6 is a detail showing the resilient mounting of one of the bearings of a folding roll.

In the drawings, the side members of the frame of a folding machine are seen at 10 and 11. The rollers of the feed table are shown at 12. These rollers are driven by any suitable means to move paper forward in the direction of arrow A, Fig. 1, and down over guide plate 13 to the meeting lines of rolls 14 and 15. In the latter part of its movement

toward these rolls, the paper is guided by deflector fingers 8, supported upon a transverse bar 9 which is mounted in the frame side members. These rolls are the first or entrance rolls of a folding mechanism comprising also rolls 16, 17, 18, and 19, with fold plates 20, 21, 22 and 23, of that type in which the paper is fed into a fold plate until it strikes a stop, after which it buckles and the buckled portion moves through the next pair of fold rolls, by means of which the folding crease is imparted.

One of the rolls 14, 15 is preferably mounted in fixed bearings while the bearings of the other roll are resiliently supported. In the present instance, the roll 14 has fixed bearings 24, while the bearings 25 of the roll 15 are located in cranks 26 mounted to swing about pivots 27 (see Fig. 6). Springs 28 with adjustable compressing means are so disposed as to act upon the cranks 26 to swing the roll 15 to resiliently contact with the roll 14.

A rod 30 is mounted in the frame parts 10 and 11 of the machine somewhat above the roll 14. A bracket 31 is provided with a hole to fit the rod 30 and is movable thereupon parallel to the axis of the roll 14. A set-screw 32 serves to hold the bracket in any position of adjustment against rotational as well as longitudinal movement. At its lower end, the bracket 31 carries a pin 33 which projects laterally in both directions and is held in position by a set-screw 34. A lateral arm 35 on the bracket 31 is provided with a threaded opening to receive a screw 36 carrying at its lower end a bearing or abutment 37 for a coil spring 38. A knurled nut 39 serves to lock the screw 36 in its positions of adjustment. At its lower end, the spring 38 bears upon a landing 40 which bridges the upstanding arms of a pair of angle members 41. Between these angle members is mounted a roller 42 which I term a stabilizing roller. The opposite ends of the angle members 41 are perforated to take the pin 33 and may swing thereon. Obviously, the turning of the screw 36 in one direction or the other will vary the compression of the spring 38, causing the roller 42 to bear more or less strongly upon the roll 14.

In the modification of Figs. 4 and 5, a pair of rollers 45 and 46 are oppositely mounted in bifurcations of a bracket 47 having an upright 48 in which is a slot 49. A bolt 50 mounted in a cross bar 51 of the frame of the

machine extends through slot 49, and a nut 52 on the bolt may be drawn up to clamp the bracket 47 and the supporting bar 51 in various adjusted positions of the rollers. Adjusting screws 53 are threadably mounted in the cross bar 51 and bear at their lower ends against the bracket 47. They are provided with lock nuts 54. The bracket 47 may be adjusted downwardly by loosening the nut 52 and by turning the adjusting screws 53. When the desired adjustment is secured, the nuts 52 and 54 are, of course, tightened. In order to permit of some adjustment of the rollers 45 and 46 lengthwise of the bar 51, I have shown a series of holes 55 in which the bolt 50 may be mounted, it being understood that threaded apertures for the adjusting screws 53 are also provided to correspond with each of the holes 55.

I have found that the mounting of my stabilizing roller or rollers to bear upon a feeding or folding roll at the middle thereof will greatly improve the operation of the machine when working upon thin paper and when the rolls are long as compared with their diameter, but under some circumstances, for instance where the thin paper is of considerably less than the roll width and is fed through the machine nearer one side than the other, it may be desirable to shift the position of the stabilizing roller or rollers somewhat, and on this account I provide the adjustment longitudinally of the supporting bar, as above described.

In the drawings, I have shown my invention applied to but one of the series of folding rolls 14, 15, 16, 17, 18 and 19. Its application to the other rolls would be exceedingly difficult if not impossible, on account of lack of space, and, moreover, its use is not so essential upon the other rolls inasmuch as they

usually act upon more than one thickness of paper.

While I have shown and described certain embodiments of the invention with more or less particularity, it should be understood that such disclosure is for the purpose of illustration only and that such details as are above enumerated are not to be construed as limitations upon the invention except as they may be specified in the appended claims.

Having thus described my invention, I claim:

1. In a paper handling machine, a folding mechanism comprising a series of parallel rotatable rolls adapted to pass paper through the said mechanism as the paper is being folded, and means located near the middle of one of the pair of rolls at the entrance to the folding mechanism for controlling the deflection of said roll during its rotation.

2. In a paper handling machine, a paper feeding roll, end bearings in which said roll is mounted for rotation, and means engaging said roll intermediate the ends thereof and adjustable lengthwise thereof for controlling deflection of the roll during rotation.

3. In a paper handling machine, a pair of rolls adapted to feed paper therebetween, pairs of end bearings in which said rolls are mounted, the bearings for one of said rolls being resiliently supported to urge said roll towards the other roll, and means adapted to engage one of said rolls intermediate the ends thereof on the side opposite the line of engagement between the two rolls for controlling the deflection of said roll during its rotation.

In testimony whereof, I hereunto affix my signature.

WILLIAM GLASGOW.