

J. H. ADAMS & E. D. WALLACE.
 FEED DEVICE FOR FOLDING MACHINES.
 APPLICATION FILED MAR. 19, 1908. RENEWED OCT. 15, 1909.

960,138.

Patented May 31, 1910.

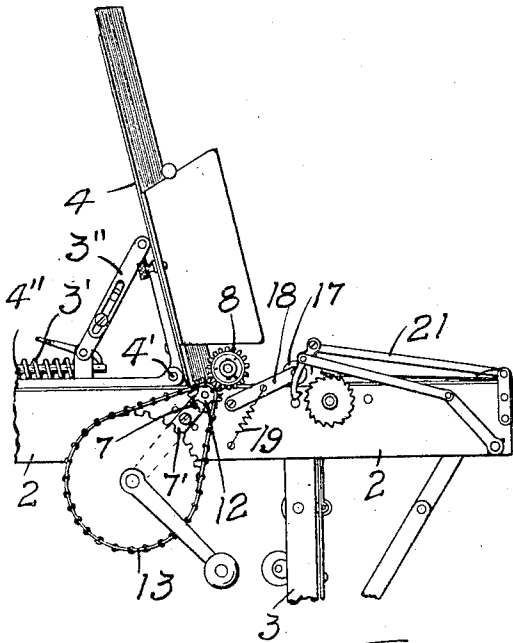


Fig. 1.

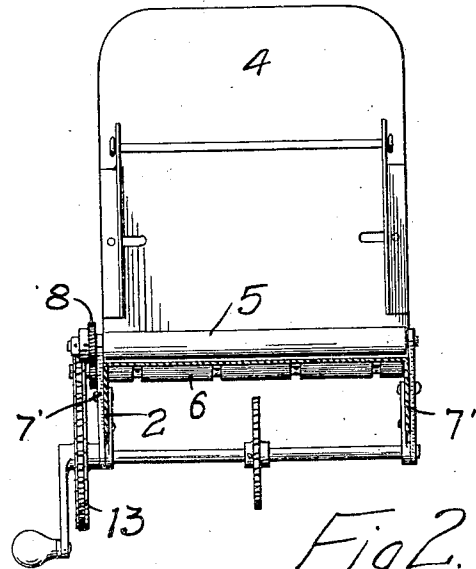


Fig. 2.

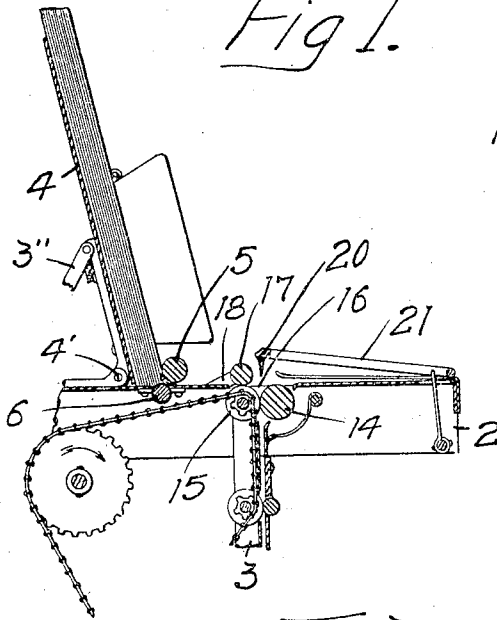


Fig. 3.

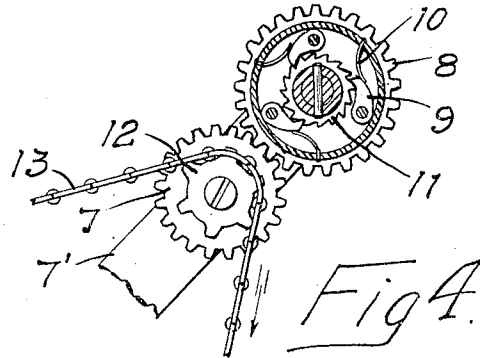


Fig. 4.

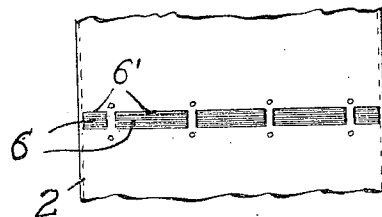


Fig. 5.

WITNESSES
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UNITED STATES PATENT OFFICE.

JOHN H. ADAMS AND ELMER D. WALLACE, OF MINNEAPOLIS, MINNESOTA, ASSIGNORS,
BY MESNE ASSIGNMENTS, TO ADAMS LETTER FOLDING MACHINE COMPANY, OF
CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

FEED DEVICE FOR FOLDING-MACHINES.

960,138.

Specification of Letters Patent.

Patented May 31, 1910.

Application filed March 19, 1908, Serial No. 422,157. Renewed October 15, 1909. Serial No. 522,806.

To all whom it may concern:

Be it known that we, JOHN H. ADAMS and ELMER D. WALLACE, of Minneapolis, Hennepin county, Minnesota, have invented certain new and useful Improvements in Feed Devices for Folding-Machines, of which the following is a specification.

This invention relates to machines for folding sheets of paper such as letters, circulars, etc., and the object of the invention is to provide means whereby the sheets may be drawn through the initial folding mechanism and speeded up higher than the feed roller without danger of tearing the sheets when the pull thereon by the folding mechanism produces a considerable strain on the paper.

A further object is to provide for a more certain, positive feed of the sheets one at a time from the stack to the folding mechanism.

In machines of this type there has been considerable difficulty heretofore in timing the travel of the sheets so that they will be drawn down through the rollers of the initial folding mechanism and each sheet kept out of the way of the one following. The natural way to hasten the progress of the sheets through the folding mechanism is to increase the speed. There has been danger in doing this, however, as the forward portion of the sheets would be acted upon by the initial folding mechanism before the rear portion of the sheets was released by the feed roller and consequently the sheets have been torn, or following each other too closely, have interfered one with the other. Our invention avoids this difficulty and permits the speeding up of the folding mechanism even before the sheets are released or discharged by the feed roller.

The invention consists generally in various constructions and combinations, all as hereinafter described and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a side elevation of the feed mechanism of a folding machine embodying our invention. Fig. 2 is a sectional view of the same. Fig. 3 is a sectional view illustrating the arrangement of the feed rollers with respect to the initial folding mechanism. Fig. 4 is a detail view of the ratchet mechanism em-

ployed in connection with the feed roller. Fig. 5 is a detail view illustrating the position of the idle roller with respect to the table.

In the drawing, 2 represents a table supported on legs 3 and provided with a carriage 4 that is hinged at 4' and is capable of adjustment back and forth on its pivot to vary the angle of inclination of the carriage according to the character of paper that it is desired to feed. The carriage is adapted to slide on a rod 4'' and a spring 3' normally holds the carriage forward with a yielding pressure. An adjustable brace 3'' is provided by means of which the upper or hinged portion of the carriage may be adjusted and secured at the desired angle. A roller 5 is mounted in bearings on the table and is arranged to contact with the outer sheet of the stack and feed the same when the roller is revolved. Beneath the table and operating through an opening therein is an idle roller 6 divided into corrugated sections having transverse grooves between them, said sections projecting up through openings 6' in the table top and contacting with the lower end of the stack of paper. Theoretically each corrugation in the idle roller 6 will receive the lower end of a sheet of paper, and the pressure of the carriage spring will be sufficient to hold the sheets in contact with the feed roller 5 and rotate the idle roller 6 causing the slope or angle of the corrugations on said idle roller to allow the lower end of the outer contacting sheet to be fed forward and released from the stack and advanced along the table top toward the initial folding mechanism. By providing openings in the table top to receive the corrugated sections and having bars or separating strips in the table top between said sections we are able to prevent the ends of the sheets from slipping down between the corrugated roller, and the edges of the openings, and at the same time render more positive and reliable the feeding of the sheets one at a time from the stack.

A gear 7 is mounted on an arm 7' and meshes with a gear 8 that is loosely mounted on the roller 5. This gear 8 carries a series of dogs 9 that are held by springs 10 in engagement with the teeth of a ratchet 11 that is secured on the projecting end of the shaft of the roller 5. A sprocket wheel 12 is se-

cured to the gear 7 and is driven by a sprocket chain 13. Rollers 14 and 15 are mounted in the table top on substantially the same level and have their peripheries projecting through an opening 16 in the top. A pressure roller 17 is carried by arms 18 pivoted on the table top and said roller 17 is held in yielding engagement with the roller 15 by a spring 19.

10 The sheets of paper passing over the top of the finely corrugated roll 6 will be fed one at a time from the stack by the roller 5 and sliding along the top of the table will pass between the rollers 15 and 17. It has been difficult heretofore to time the travel of the sheets so that each one will be drawn down between the rollers 14 and 15 before the succeeding sheet fed forward between the rollers 15 and 17 will contact with the descending preceding sheet. The rollers 14 and 15 may be speeded up to hasten the delivery, but by so doing there is danger of tearing the sheets when the pull on the roller 5 becomes too severe. Should this happen, however, with the mechanism employed by us, the roller 5 will slip and the dogs will slide over the teeth of the ratchet and allow the feed roller to operate without operating the gear. This will prevent all danger of tearing the sheets and their travel can be accurately timed so that one sheet will have passed down between the rollers 14 and 15, which may be given any desired speed, before the incoming horizontally moving sheet has passed between the rollers 15 and 17 a sufficient distance to contact with the preceding sheet. The knife 20 supported on the oscillating frame 21 is shown and described in our pending application No. 403,584, filed November 25, 1907, and detailed description and illustration is not necessary herein, this application being confined to the mechanism for allowing slippage of the feed roller to compensate for any increase in speed of the folding mechanism, and to the device for making more certain the feeding of one sheet at a time to the folding mechanism.

Instead of using a roller under the stack of paper we may employ a belt having a moving surface upon which the paper rests and by which the sheets are fed forward in the operation of the machine. This being an obvious modification we have not thought an additional sheet of drawing to illustrate the same necessary.

We claim as our invention:

1. In a folding machine, the combination, with a feed table, and a carriage thereon, of a feed roller arranged to engage the sheets of paper in a substantially upright position, a pair of rollers arranged one above the other to which the paper is delivered from said feed

roller, a roller arranged to coöperate with the lower roller of the pair, means for directing the paper downwardly between said last named roller and the lower roller of the pair, and said feed roller having means whereby when the tension exerted by said pair of rollers on the paper exceeds a predetermined degree, said feed roller will slip and allow the feed of the paper to be hastened, substantially as described.

2. The combination, with a feed table, of a carriage supported thereon and inclined to the horizontal and adapted to support a stack of paper in a substantially upright position, a feed roller arranged to engage the stack of paper, means for yieldingly holding the carriage toward said roller, and a corrugated idle roller mounted in said table between said carriage and said feed roller, and arranged to receive the lower ends of the sheets of paper in said stack and the forward sheet being in advance of the axis of said idle roller, and said idle roller being revolved to feed the outer sheet forward by the pressure of said carriage feeding means.

3. The combination, with a feed table, of a carriage movable thereon, and having an inclined portion that is hinged at its lower end on said table and adapted to support a stack of paper at an angle to the horizontal, means comprising a slotted bar for adjusting said hinged section to vary its degree of inclination, a feed roller and means for holding said carriage toward said feed roller with a yielding pressure.

4. The combination, with a feed table, of a carriage adapted to support a stack of paper in a substantially upright position, a feed roller arranged to engage the sheets and feed them forward one at a time, and a roller having a roughened surface arranged below said feed roller and engaging the lower ends of the stack of sheets, the forward sheet contacting with said roughened surface roller in front of its axis, means for holding said carriage toward said feed roller with a yielding pressure whereby the engagement of the forward sheet with the roughened surface roller will rotate the same to feed the sheets forward, substantially as described.

5. The combination, with a feed table, of a carriage adapted to support a stack of paper in a substantially upright position, and a moving surface provided in said table and with which the lower end of the stack of paper is in contact, said surface being adapted to feed the sheets forward in the operation of the machine and means for pressing said carriage forward and the engagement of the forward sheet with said moving surface actuating the same to feed the sheets, substantially as described.

6. The combination, with a feed table, of

a carriage movable thereon, and adapted to support a stack of paper in a substantially upright position, a feed roller adapted to engage the sheets and feed them forward one at a time, said table having a series of openings in its floor, and the roller having a roughened surface operating in said openings and contacting with the lower ends of the stack of paper, the forward sheet engaging said roller in front of its axis and means for pressing said carriage forwardly, whereby the engagement of the forward sheet with said roller will rotate the same to feed the sheets.

7. The combination, with a feed table, of a carriage movable thereon, and adapted to support a stack of single sheets of paper in a substantially upright position, a feed roller adapted to engage the sheets and feed them forward one at a time, and a roller having a series of comparatively fine longitudinal corrugations, each corrugation receiving the lower end of a sheet and the forward sheet engaging said corrugated roller in front of its axis, whereby the lower ends

of the sheets will be separated and the feeding of said sheets one at a time facilitated.

8. In a folding machine, the combination, with a feed table, of a feed roller, a pair of rollers arranged one above another to which the paper is delivered from said feed roller, a roller arranged to cooperate with the lower roller of the pair, means for directing the paper downwardly between said last named roller and the lower roller of the pair, and a ratchet mechanism provided in connection with said feed roller whereby when the tension exerted by said pair of rollers on the paper exceeds a predetermined degree said feed roller will slip and allow the feed of the paper to be hastened, substantially as described.

In witness whereof, we have hereunto set our hands this 14th day of March 1908.

JOHN H. ADAMS.
ELMER D. WALLACE.

Witnesses:

J. H. BALDWIN,
J. A. BYINGTON.