

O. S. GAUCH.
 PAPER FOLDING AND DELIVERY MECHANISM.
 APPLICATION FILED MAR 28, 1911.

1,003,446.

Patented Sept. 19, 1911.

2 SHEETS-SHEET 1.

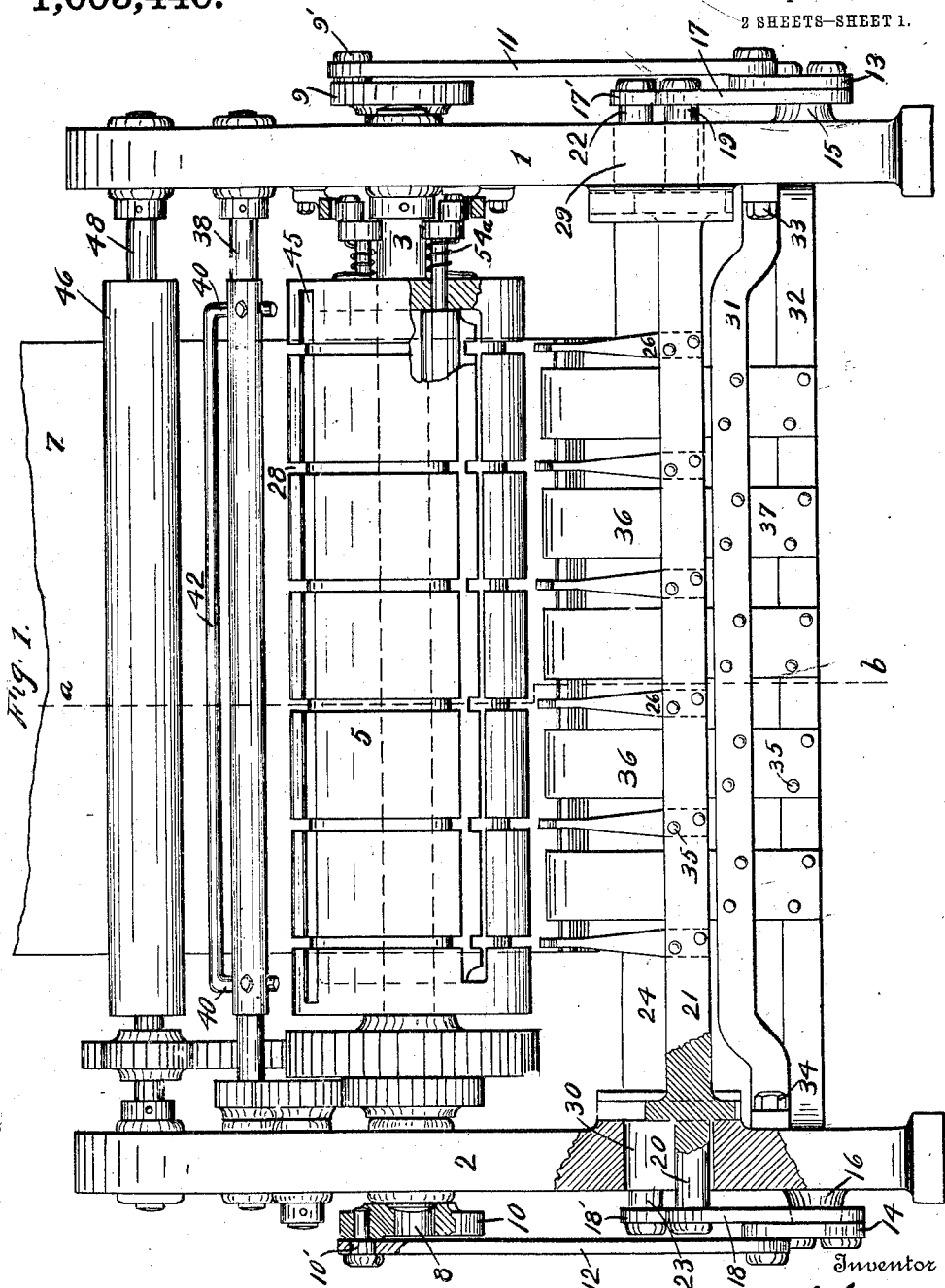


Fig. 1.

Witnesses

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 David J. Davis

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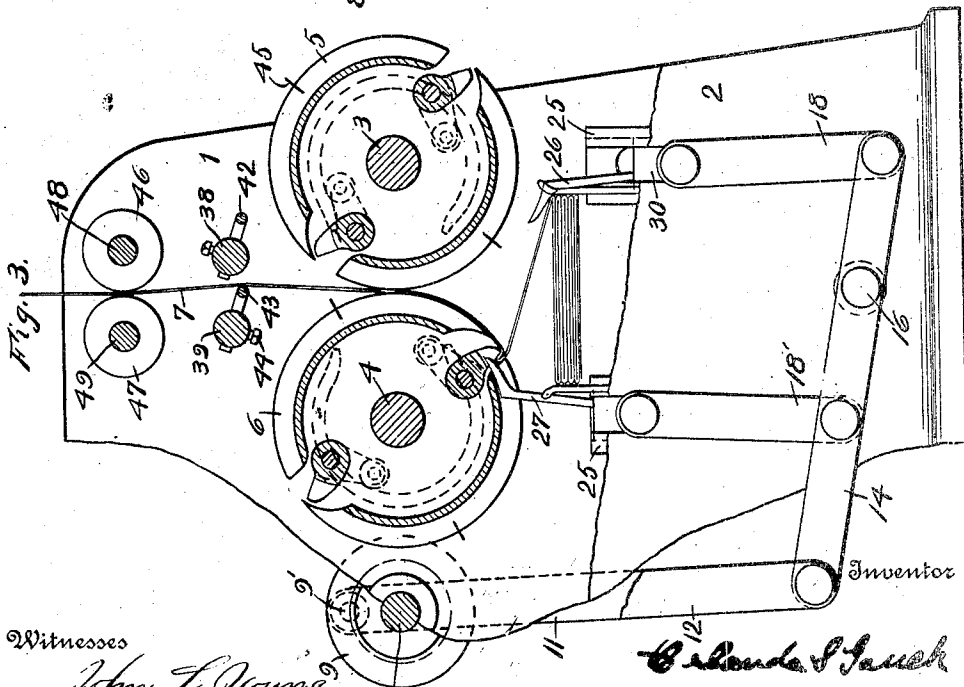
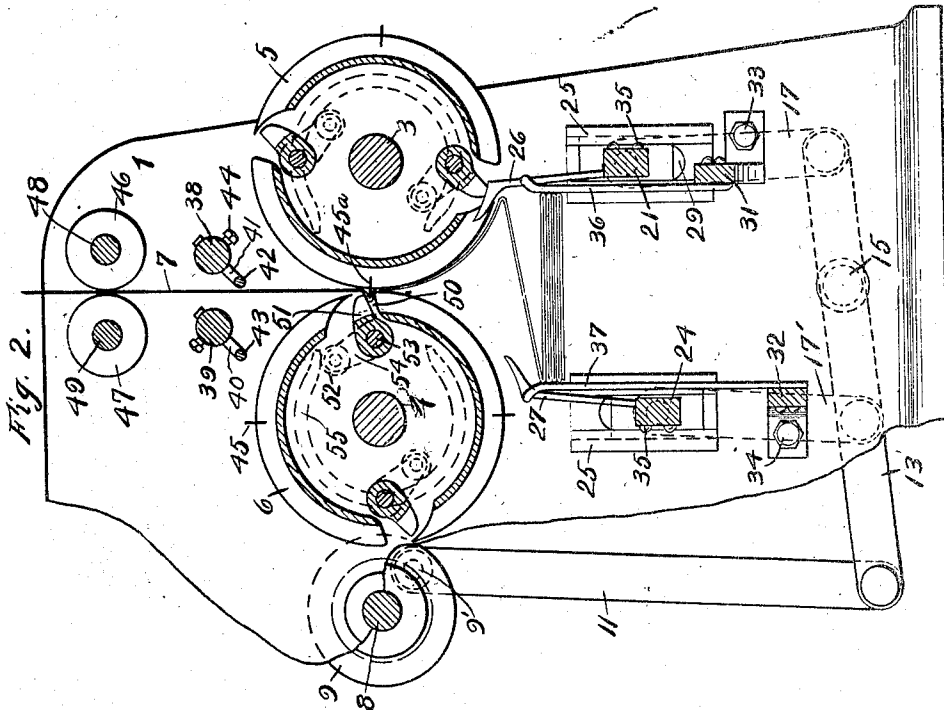
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 Attorney

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UNITED STATES PATENT OFFICE.

ORLANDO S. GAUCH, OF SHELBY, OHIO.

PAPER FOLDING AND DELIVERY MECHANISM.

1,003,446.

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To all whom it may concern:

Be it known that I, ORLANDO S. GAUCH, a citizen of the United States of America, residing at Shelby, in the county of Richland and State of Ohio, have invented certain new and useful Improvements in Paper Folding and Delivery Mechanism, of which the following is a specification.

My invention relates to improvements in a paper folding and delivery mechanism and is of the type that folds the paper in opposite directions alternately, producing a pile of continuous zig-zag folded paper for sales books or the like.

The objects of my invention are to provide an auxiliary means of taking up a sufficient amount of web to make each alternate zig-zag fold, thus obviating the usual strain on the web which results in tearing it when auxiliary means are not employed; to provide means of stripping each fold of the web from the cylinders and packing the pile in a compact form between packer arms from which any part or all of the pile can be readily removed without interfering with the operation of the machine. I attain these and other objects by the mechanism herein-after fully described and illustrated in the accompanying drawings in which:—

Figure 1 is a front elevation of a folding mechanism showing my improvement applied thereto. Fig. 2 is a vertical cross sectional elevation of the device in line *a—b* of Fig. 1 showing the stripper fingers and jaws in one position. Fig. 3 is a vertical cross sectional elevation of the device showing the stripper finger and jaws in the opposite position.

Referring more specifically to the drawings, reference numerals 1 and 2 represent the housings of the frame, in which are suitably journaled the shafts 3 and 4 on which are rigidly mounted the folding cylinders 5 and 6 of the well known "tucker-blade and jaw type," and which forms no part of the present invention. It will be understood, of course, that these cylinders are made of such a size as will produce the desired length of the folded web. The cylinders are driven in opposite directions at a high speed and are supplied with the web 7 by feed rolls 46 and 47 described hereinafter. A shaft 8

preferably journaled in the housings 1 and 2 and suitably geared, or otherwise driven at the proper speed, extends through the housings and has disks 9 and 10 mounted and rigidly held in place upon the outer ends. The disks are provided with crank pins 9' and 10' and connecting rods 11 and 12 are pivotally connected at their lower free ends to oscillating fulcrum levers 13 and 14. The fulcrum levers are pivotally mounted on the fulcrums 15 and 16 provided on the housings. Link-bars 17 and 17' and 18 and 18' are provided, the link-bars 17 and 18 being pivotally connected to the studs 19 and 20 to which is rigidly attached the stripper finger-bar 21 and the link-bars 17' and 18' being similarly connected to the studs 22 and 23 to which the stripper finger-bar 24 is rigidly attached.

The stripper finger-bars 21 and 24 are slidably connected to the housings 1 and 2 by means of the guides 25 which may be of any desired construction and which bars have attached thereto and rigidly held in place thereon by any desired means, the stripper fingers 26 and 27 preferably formed to correspond with the shape shown which is adapted to engage the annular grooves 28 formed in the peripheral surfaces of the folding cylinders 5 and 6. Slots 29 and 30 are formed in the housings 1 and 2 to permit free reciprocating movement of the studs 19, 20, 22 and 23 which pass therethrough.

It will be seen that the rotating shaft 8 transmits an alternating reciprocating motion to the stripper fingers 26 and 27 through the medium of the crank system of levers, connecting rods and links above described. It will be understood, of course, that the speed of the shaft 8 must be suitably timed to operate in conjunction with the folding cylinders and delivery mechanism.

The cross bars 31 and 32 are attached to the housings 1 and 2 and rigidly held in place by any ordinary means, as for instance the bolts 33 and 34. The cross-bars have rigidly attached thereto by means of rivets 35, the packer arms 36 and 37 having their upper ends slightly converged, as shown in Figs. 2 and 3, and being adapted to receive the alternate folds of the web or sheets as they are stripped from the folding cylinders

and deposited by the stripper fingers, between the packer arms.

The shafts 38 and 39 are suitably journaled in the housings 1 and 2 having transverse openings formed therein adapted to adjustably receive at right angles bent ends 40 and 41 of the bars 42 and 43 thus providing a parallel relation between the bar 42 and shaft 38 and bar 43 and shaft 39 that can be adjusted in its parallel relation thereto. The bars are rigidly held in any adjusted position by means of set screws 44. The shafts 38 and 39 are suitably geared and timed to permit the bars 42 and 43 to alternately engage the web 7 and divert a sufficient amount of the web from its line of travel to provide for each fold preventing the folding mechanism on the cylinder from gripping the web and tearing it.

It will be observed that the parallel bars provide auxiliary means whereby a predetermined amount of web is drawn back from between the cylinders or diverted from its line of travel to compensate for the amount of web taken up by the blades in making the folds, thus obviating the strain that frequently breaks the web. As the shafts carrying the parallel bars revolve, the outer periphery of the bars alternately contact with the web forcing it out of its regular path or line of travel to each side thereof, alternately taking up the pre-determined amount of the web to make the fold. This operation is repeated every time a fold is made on either cylinder.

The ordinary feed rolls 46 and 47 are used, the shafts 48 and 49 being suitably journaled in the housings 1 and 2. The feed rolls are driven at any speed proper to withdraw an equal amount of web for the purpose intended from the printing press.

The operation of my improved device is as follows: The web 7 which is to be folded is drawn from a printing press or other source of supply and passes between the feed rolls 46 and 47 where it is forced by the friction of the rolls toward the folding cylinders and between the shafts 38 and 39 of the auxiliary feeding means of the web where the bars 42 and 43 alternately divert the web out of its path or line of travel at the proper time taking up the proper amount of the web fed from between the rolls to compensate for the amount used on the end of the tucker blade in making the fold. When the bar 42 releases the web (as shown by Fig. 2), the tucker blade 45^a in the folding cylinder 5 will force the web in the lateral opening 50 of the cylinder 6 taking up all the slack web and under the spring held jaw 51 at which time the cam roller 52 which is rigidly connected to the shaft 53 through the arm 54 will be released from the circular cam 55 allowing the jaw 51 to grip the fold of the web by the tension

of the spring 54^a upon the shaft 53, and hold same securely as the cylinder revolves about its axis to the position shown in Fig. 3, and the roller 52 again engages the cam 55 opening the jaw and releasing the fold which is then carried by the stripper finger 27 to the packer rods. It will be obvious that as the operation is repeated alternately, the web will be folded in zig-zag form and packed between the packer arms and that after a predetermined number of folds, regulated by the length of the packer arms 36, has been packed, they may be removed from the folder by the operator without interrupting the operation of the folder.

What I claim is:—

1. In a folding and delivering mechanism for paper, the combination of a pair of folding cylinders of the spring jaw and tucker blade type with an auxiliary feeding means adapted to take up a sufficient amount of web between its source of supply and the folding cylinders to form a fold, and reciprocating means operated by a rocker arm mechanism to strip the web from the folding cylinders as it is folded in zig-zag fashion.

2. In a folding and delivering mechanism for a paper web, housings, folding cylinders journaled in said housings, shafts mounted in said housings carrying bars having their free ends bent at right angles, the bent ends of said shaft bars being adjustably fitted to apertures in the shafts and adapted to contact with the web and take up a predetermined amount of said web from its source of supply for folding purposes.

3. The combination with a pair of folding cylinders for folding a paper web, of feed rolls for the web, adjustable means to divert the web from its direct line of travel whereby a sufficient amount of said web is drawn back from the free end to compensate for the amount necessary to use in making a fold, housings, reciprocating means connected to the housings, a series of stripping fingers connected to said reciprocating means whereby said fingers strip the folded web from the cylinders and pack it in proper guides.

4. The combination with a pair of folding cylinders for folding a paper web, of feed rolls for the web, adjustable means to divert the web from its direct line of travel whereby a sufficient amount of said web is taken up from the source of supply to compensate for the amount necessary to use in making a fold, housings, reciprocating means connected to the housings, a series of stripping fingers connected to said reciprocating means whereby said fingers strip the folded web from the cylinders and a series of packer arms to receive said folded web sections.

5. The combination of folding and de-

livery mechanism comprising a pair of folding cylinders; rocker arm mechanism, stripper fingers attached to said rocker arm mechanism, said fingers being adapted to strip the web from the cylinders alternately and pack a pile of folded web between packer arms, and auxiliary means to divert the excess web from its line of travel and to provide slack in the web to make the fold

before the actual operation of folding takes 10 place.

In testimony whereof I affix my signature in presence of two witnesses.

ORLANDO S. GAUCH.

Witnesses:

JOHN H. COSS,

D. J. DAVIES.