L. C. CROWELL.

MECHANISM FOR FOLDING PAPER.

No. 181,250. Patented Aug. 22, 1876.

Fig. 1.

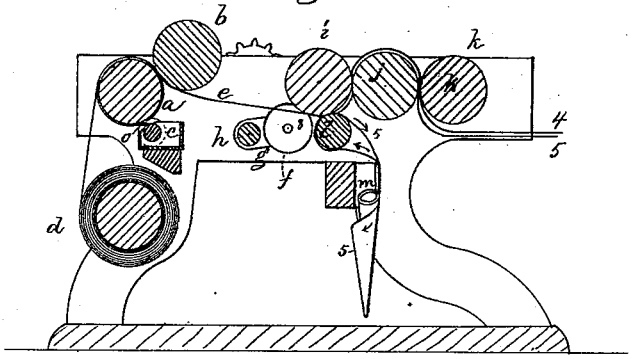


Fig. 5.

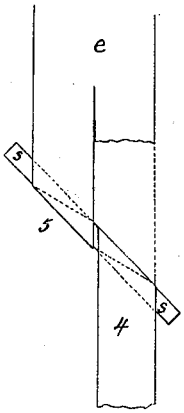


Fig. 6

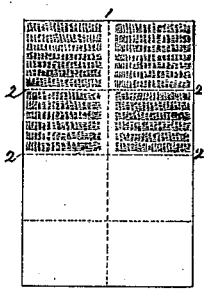


Fig. 2.

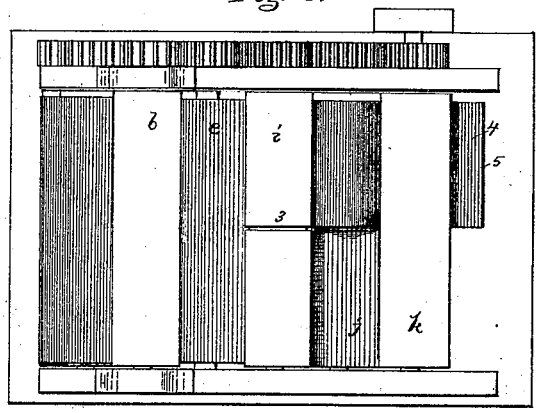


Fig. 3.

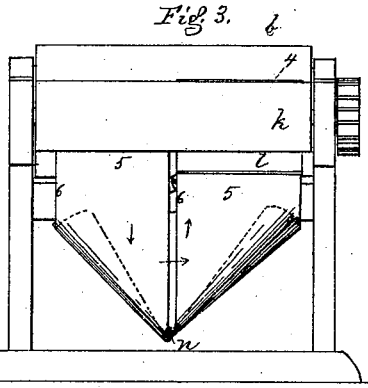


Fig. 4.

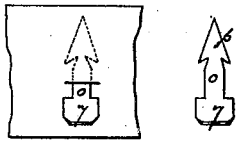
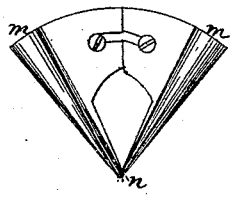


Fig. 7.



Witnesses.

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W. J. Pratt.

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Luther C. Crowell

per Crosby & Gregory Attys

UNITED STATES PATENT OFFICE.

LUTHER C. CROWELL, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN MECHANISMS FOR FOLDING PAPER.

Specification forming part of Letters Patent No. **181,250**, dated August 22, 1876; application filed April 3, 1876.

To all whom it may concern:

Be it known that I, LUTHER C. CROWELL, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Mechanism for Folding Paper, of which the following is a specification:

This invention relates to mechanism for folding a web of paper issuing from between the press or type cylinders of a perfecting-press, or in other places where it is desired to fold quarto sheets; and the invention consists in a knife or equivalent to sever the web of paper longitudinally, in combination with mechanism to deliver one-half of the sheet upon the other half, the sheets so lapped being pasted at intervals, if desired, after which it is folded; and the invention also consists in a new method of lapping paper to be folded by folding mechanism.

Figure 1 represents a portion of a perfecting-press with my improvements added. Fig. 2 is a top view thereof. Fig. 3 is a front view of the guide. Fig. 4 is a detail of the pasting device; Fig. 5, a modification of the guide. Fig. 6 represents a sheet of paper as delivered from the cylinder, showing printed and unprinted portions; and Fig. 7 represents the guide *m* separate.

The cylinder *a* is covered with cloth, and is one of the usual impression-cylinders, and opposed to it is the type-cylinder *b*, the web of paper *e* being supplied, in this instance, from a roll, *d*, herein shown as located near the impression-cylinder.

In this instance of my invention the web is of a width to produce a quarto or double-sheet paper, and a portion of the web issuing from between the impression and printing cylinders is left unprinted, the unprinted portions running longitudinally through the center of the web and transversely of the web, as denoted in Fig. 6 by lines 1 2. This printed web is then cut longitudinally at or near the center of the unprinted line 1 by a positively-rotated or other suitable cutter, *f*, on a shaft carried by arms *g* of a rock-shaft, *h*, the edge of the cutter entering a groove, 3, in a bed-roller, *i*, by which the paper is supported on its side opposite the cutter. One-half, 4, of this web is passed up over the first cylinder *j*, and then under the second cylinder *k* of the pair of folding-cylinders, provided with blades and jaws and cutters to fold and sever the sheet transversely on the alternate lines 2, Fig. 6, such mechanism being fully described in an application filed by me in the United States Patent Office November 11, 1875, and the portions 2 remaining uncut, serving as the line on which the completed paper is folded from top to bottom, or the white central portion parallel with the length of the columns. The other half, 5, of the web is led down over a leading-roller, *l*, and about a guide, *m*, composed, as shown in Figs. 1, 3, and 7, of a V-shaped frame, preferably clad at its edges with sheet metal, formed as cones, the ends of largest diameter being nearest the leading-roller, and the smaller ends coming substantially together at *n*. The metallic edges are shown in dotted lines, Fig. 3. It will be noticed the portion 5 passes in Fig. 3 down in front of the guide; then back about the left-hand edge; then across the back of the guide, as shown by the dotted arrow; then around the other edge, up in front of the guide, and under *l*, and then over the roller *l*, where it is delivered against the under side of portion 4, with its outer edge 6 at the center of the machine, and substantially parallel with the inner edge of the portion 4, and in this way the folding-cylinders are made to operate on a web composed of two thicknesses of paper, instead of one, as usual, and I am enabled to manipulate a broad sheet for a quarto paper as readily as if the sheet was narrow, as usual with newspapers known as "single-sheet."

The impression-cylinder has affixed to its cloth or felt cover, at intervals from its center to one end, a number of paste-appliers, consisting, in this instance of my invention, of pieces *o* of sheet metal, of the form shown in Fig. 4, the barbed or hooked ends *p* passing through the cloth covering, and the flat ends 7, at each rotation of the impression-cylinder, wipe over and against the surface of a roller revolving in a paste-trough, *c*. These paste-appliers *o* act to deliver spots of paste or gum on each alternate unprinted portion 2 and at the under side of the half 4 of the web, and when the half 5 is laid against the under side of half 4, as described, the paste or gum causes the parts 4 5 to adhere together on each alter-

nate line 2, this paste serving to keep the two sheets together at their centers, the two sheets forming the folded paper, and the quarto paper, delivered as described, will have its two sheets attached at their centers parallel with the length of the printed columns, and all the edges of the paper will be cut ready to be opened as the leaves of a book.

The cutter-shaft 8 will be driven by a belt or gear in any suitable way, and from any proper moving part of the machine, and its carrying-arms will be arranged to move toward or from the roller *i*, to sharpen the cutter, or for purposes of adjustment.

Instead of the guide *m*, constructed as shown in Figs. 1 and 3, I may place a cylindrical guide, *s*, diagonally across the entire sheet *e*, and lead the portion 5 backward around under and up over it, and then to the under side of portion 4, as before described.

I am not aware that a web of paper has ever been split on the press or folding-machine, and delivered one-half under the other half, to be subsequently folded, as herein described, and I do not, therefore, intend to limit my invention to the exact devices described, as many equivalents for each of the parts may be made.

I claim—

1. The combination of the bed-roller and a cutter with a guide, substantially as described, to conduct one portion of the severed web laterally and against the other portion.

2. The bed-roller and cutter, in combination with a leading-roller and the guide, to deliver one part of the severed web laterally and against the other part, substantially as described.

3. In a perfecting-press, provided with printing and impression cylinders, the combination, with a cutter and bed-roller, of a guide, substantially as described, to carry laterally, and to lap, one portion of the severed web over against the other portion, substantially as described.

4. The combination, with the impression-cylinder, of paste-appliers *o*, attached to the cover of the impression-cylinder, and adapted to apply paste to portions of the web to be subsequently folded, substantially as described.

5. The combination of the mechanism to paste and mechanism to sever the web longitudinally with a guide, substantially as described, to direct the portion of the severed web longitudinally and against the pasted surface of the other portion, substantially as set forth.

6. The method herein described of folding paper in a printing-press or folding-machine, consisting in automatically severing the web longitudinally, and then directing one of the severed portions laterally and against and in contact with the other severed portion, to be subsequently severed transversely and folded, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LUTHER C. CROWELL.

Witnesses:

G. W. GREGORY,

W. J. PRATT.