

C. ELLERY.
Paper-Feeding Machine.

No. 215,051.

Patented May 6, 1879.

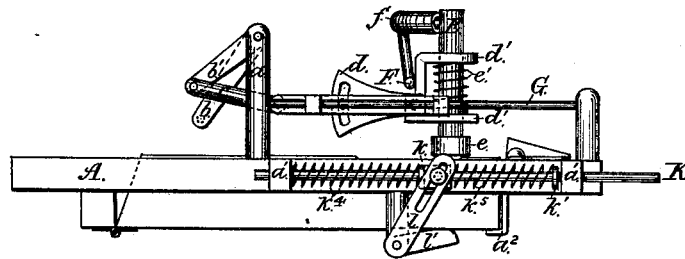


FIG. 1.

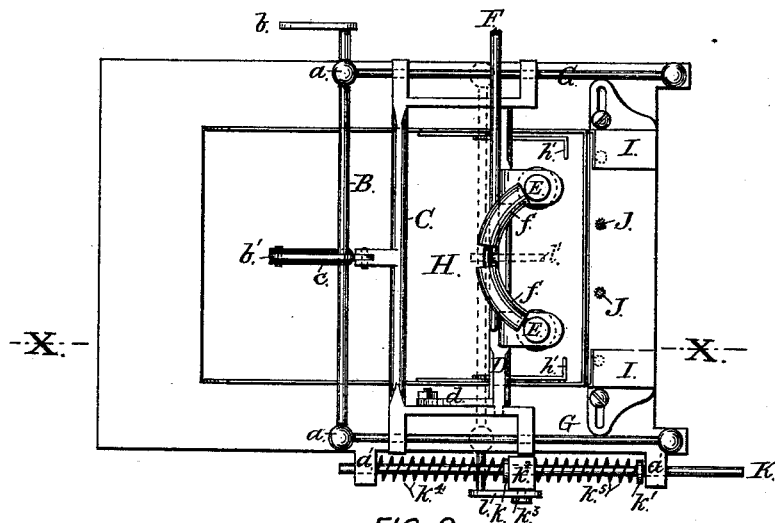


FIG. 2.

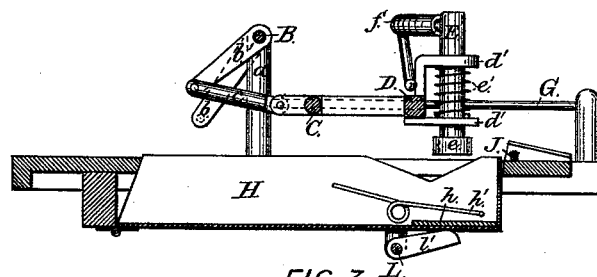


FIG. 3.

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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN PAPER-FEEDING MACHINES.

Specification forming part of Letters Patent No. **215,051**, dated May 6, 1879; application filed December 18, 1878.

To all whom it may concern:

Be it known that I, CHARLES ELLERY, of the city and county of Albany, and State of New York, have invented certain new and useful Improvements in Paper-Feeding Devices for Printing-Presses, of which the following is a full and exact description, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a side elevation of my device; Fig. 2, a plan view, and Fig. 3 a longitudinal section at the line X X.

My invention consists of the combination and arrangement of parts herein shown and described for constituting a paper-feeding device, wherein the sheets of paper are taken up and retained by the feeding mechanism by means of atmospheric pressure.

As shown in the drawings, A is the table of the machine; *a*, standards erected on the table as bearings for the rock-shaft B; *b*, an arm on the rock-shaft B, to which an oscillating motion is imparted by the printing press to which the feeding device is applied; *b'*, another arm on rock-shaft B, for moving the sliding head; C, the sliding head, connected to the arm *b'* by the rod *c*. Said sliding head carries a pivoted cross-bar, D, having a slotted quadrant, *d*, for adjusting and securing it in the required position. The said cross-bar is provided with ears or lugs *d'*, adapted to receive the sliding tubes E, which are provided at their lower ends with elastic cushions *e*, made of india-rubber or other suitable material, for forming an air-tight joint between the tubes and sheets of paper. Each of these tubes has a spring, *e'*, arranged to force it downward and to compensate for any inequality in the depth of the pile of paper.

F, a suction-pipe, to which an ordinary exhausting-pump is connected for producing a vacuum therein. This pipe is connected to the sliding tube E by means of the flexible branch pipes *f*, which permit the tubes to move up and down when required.

G, guide-rods, upon which the sliding head C moves; H, the paper-holder, consisting of a pan hinged at its rear end to a recess in the table A, so that its flanges will be flush, or nearly so, with the top of the table. Attached to its bottom, near its front end, is a blanket, *h*, which forms a cushion, on which the under

sheet of the pile of paper rests. Over this cushion, at each side of the pan, is a finger, *h'*, attached to a spring, which bears upon the top sheet of the pile of paper.

I, guides (adjusted to the width of the paper) through which the paper passes on its way from the holder H to the press; J, brushes inserted in the table A, for preventing more than one sheet at a time from being carried from the holder H into the press; K, a sliding rod, (operated by the printing-press,) working in the bosses *a'* on the side of the table. It is provided with two collars, *k* and *k'*, and a hub, *k''*, (sliding freely on the rod,) with a wrist-pin, *k'''*.

A spring, *k''''*, interposed between one of the bosses *a'* and the collar *k*, which bears against the hub *k''*, forces the rod forward toward the press.

The spring *k''''*, interposed between the collar *k'* and hub *k''*, presses the hub against the collar *k*, except when the said spring yields to an excessive resistance, as hereinafter set forth.

The wrist-pin *k'''* engages in the slotted opening of the arm *l*, secured to the shaft L, running transversely beneath the table A, and carrying the wiper *l'*, which bears against the bottom of the holder H, to operate it (the holder) in the manner hereinafter described.

The operation of my device is as follows: A pile of paper is placed in the holder H, at its end beneath the sliding head C. The rod K is forced back, (by any suitable attachment to the printing-press,) carrying with it the wrist-pin *k'''*, which moves (through the arm *l*) the shaft L and its wiper *l'*, to raise the holder H until the top sheet of the pile of paper is carried up into contact with the lower end of the sliding tubes E, upon which the exhausting-pump is constantly operating. When this is attained the top sheet of the pile forms a stopper for the end of the sliding tubes, and allows a partial vacuum to form therein, causing the sheet of paper to adhere by atmospheric pressure to the bottom of the tubes. Simultaneously therewith the sliding rod K is forced back by the spring *k''''*, carrying back the arm *l* and wiper *l'*, letting the holder drop down on the hook *a''*, where it is supported. As the holder H recedes the sliding tubes E hold up the central part of the sheet of paper, while the

spring-fingers *h* hold down the edges of the sheet until they are drawn from beneath the said fingers by the falling motion of the holder. By this action the top sheet is separated from the pile in such manner that only a single sheet at a time can be fed into the printing-press. When the sheet is clear from the spring-fingers the sliding head *C* moves forward, carrying the sheet adhering to the tubes *E*, until the sheet is caught by the fingers of the press and is retained by them. The sliding head *C* then returns to its normal position, leaving the several parts of the feeding device in their proper positions for a repetition of the operation described.

By means of the spring *k*⁵ provision is made for the varying depth of the pile of paper in the holder *H*.

The distance moved by the sliding rod being always the same, it follows that with a deep pile of paper in the holder a slighter lift is required to bring the upper sheet against the tubes *E* than with a shallow pile. To compensate for this difference, when the top sheet of the pile reaches the end of the tubes the spring *k*⁵ is compressed until the full stroke of the rod is completed, after which the rod is returned by the pressure of said spring to its normal position.

From the foregoing it is obvious that by the coaction of the holder *H* and its spring-fingers *h* with the sliding head *C* and its sliding tubes *E*, each sheet of paper is separated from the pile in the holder and fed to the press without the intervention of other instrumentalities.

I claim as my invention—

1. The sliding head *C*, having an adjustable cross-bar, *D*, carrying the sliding tubes *E*, provided with elastic cushions *e* and springs *e'*, and connected by the flexible pipes *f* to the suction-pipe *F*, in combination with a holder, *H*, having a vertically-vibrating motion, as herein specified.

2. The combination, with the paper-holder *H* and the shaft *L*, provided with the arm *l* and wiper *l'*, of the sliding rod *K*, hub *k*², wrist-pin *k*³, and springs *k*⁴ and *k*⁵, as and for the purpose specified.

3. The combination, with a vibrating paper-holder, *H*, provided with the spring-fingers *h'*, arranged at opposite sides of said holder, as described, of the sliding head *C*, provided with sliding tubes *E*, adapted to separate and feed the sheets of paper in the manner herein described.

4. In a paper-feeding device, the combination, with the sliding head *C*, provided with the sliding tubes *E*, having elastic cushions *e* and springs *e'*, as herein described, of the vibratory paper-holder *H*, the shaft *L*, provided with the arm *l* and wiper *l'*, and the sliding rod *K*, provided with the hub *k*² and springs *k*⁴ and *k*⁵, essentially as herein specified.

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