L. HARLOW.

Machine for Feeding Paper Sheets.

No. 215,058. Patented May 6, 1879.

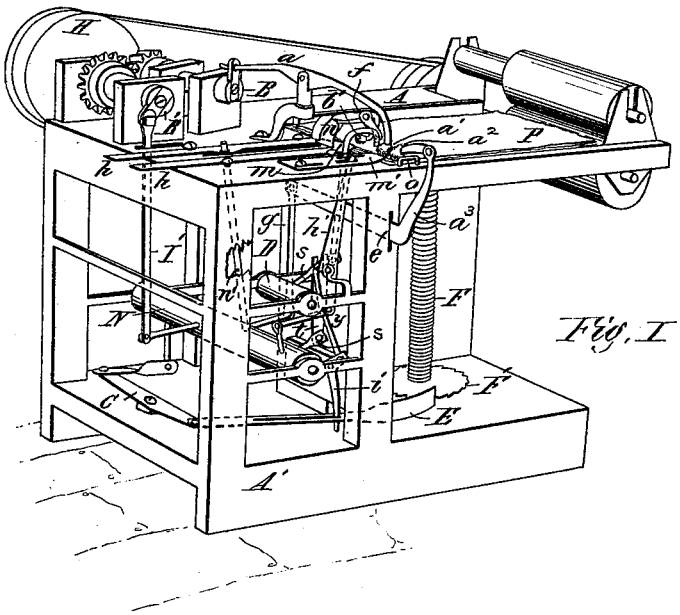

Fig. I.

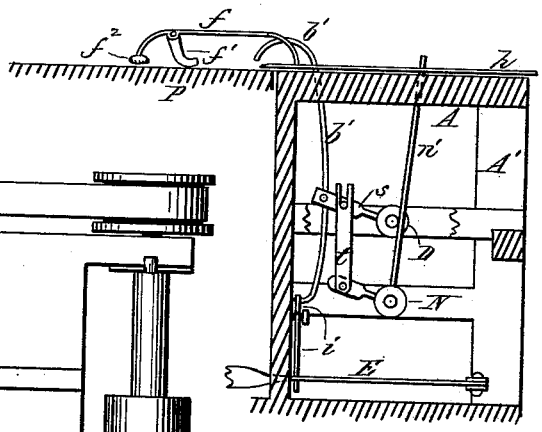

Fig. III.

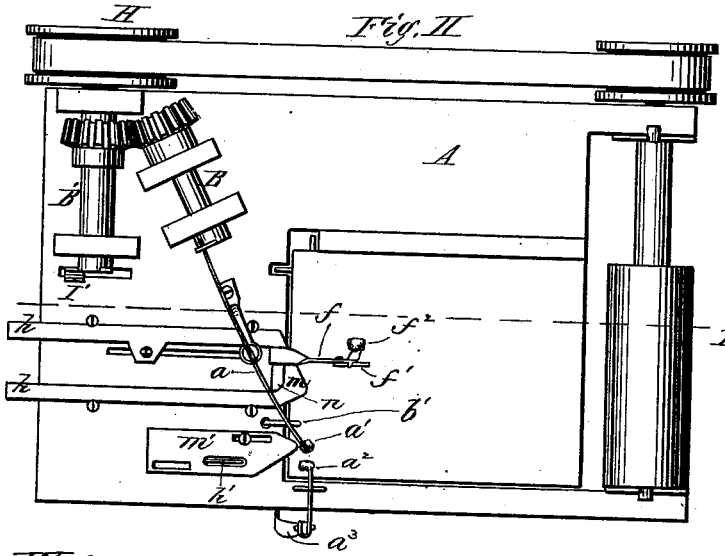

Fig. II.

Witnesses,
C. E. Buckland.
Fred'k E. Curtis.

Lucius Harlow. Inventor;
By T. A. Curtis,
his atty.

UNITED STATES PATENT OFFICE.

LUCIUS HARLOW, OF HOLYOKE, MASSACHUSETTS.

IMPROVEMENT IN MACHINES FOR FEEDING PAPER SHEETS.

Specification forming part of Letters Patent No. **215,058**, dated May 6, 1879; application filed December 21, 1878.

To all whom it may concern:

Be it known that I, LUCIUS HARLOW, of Holyoke, in the State of Massachusetts, have invented a new and useful Improvement in Machines for Feeding Paper Sheets; and that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, and to the letters of reference marked thereon.

The object of my invention is to feed sheets of paper to any machine in which such paper is to be operated upon, such as counting, folding, printing, calendering, ruling, and many other operations; and this invention is an improvement upon that described in Letters Patent No. 207,805, granted to me September 10, 1878; and it consists, first, of two friction-starters and two separators combined, for the purpose of more perfectly and more uniformly separating the uppermost sheet in the pile from those below; and it consists, second, of an auxiliary starter combined with the separator, by which thin sheets of paper are each more surely and uniformly moved forward from the pile on the platform, all which will be more fully hereinafter described.

Figure I is a perspective view of my invention. Fig. II is a plan view of the same; and Fig. III is a partial vertical section at line I of Fig. II.

In the drawings, A is a platform supported by a frame, A′, with a rock-shaft, N, having bearings in the frame, and operated by a rod, I′, connecting an arm on shaft N with a crank-arm on the shaft B′, the general features and mechanism of the machine being much the same as are described in Letters Patent granted to me September 10, 1878. To the frame A′, at *e*, is pivoted an elbow or lever, a^3, to one arm of which is attached a rod, *g*, connecting it with an arm of the rock-shaft N, by which it is actuated, and to the other end of the elbow is attached a pad or friction-starter, a^2, which is so attached as to be just above the movable platform supported on the upper end of the vertical screw F, upon which the pile of paper is placed. A separator, *m′*, is arranged to have a limited sliding movement along the top of the fixed platform A, and is actuated by a pivoted lever, *h′*, connected with an arm of the rock-shaft N, the forward end of this separator *m′* projecting a little over the platform P when moved into its most forward position. A main separator, *h*, is also arranged to move to and fro upon the platform A, and this separator is provided with a vertical piece or pusher, *n*, and this separator is actuated by an arm, *n′*, of the rock-shaft N. The rod *a*, having the pad or friction-starter a^1 attached to its free end just above the platform P, is actuated by a revolving shaft, B, this rod *a*, the separator-slide *h*, and pusher *n* being all fully described in my before-mentioned Letters Patent of September 10, 1878. To the pusher *n*, however, or to any part of the mechanism which may be desirable or most convenient, I attach a rod, *f*, which has a piece or trip, f^1, pivoted thereto, and whose forward end is provided with a friction-pad, f^2, extending down sufficiently to touch the topmost sheet in the pile of paper laid upon the vertically-moving platform P. This rod *f* should be sufficiently elastic to readily adjust the pad f^2 to the paper when the rod extends forward in its natural position; but when the separator and rod move back the trip f^1 in dragging along the paper is caused to assume a vertical position, where it is held, and thus raises the pad, so that the sheet may not be moved in the wrong direction.

The gage *b′* is bent at its upper part, so that its end may rest upon the platform P or upon the pile of paper placed thereon, and it also extends down and is connected at its lower end with one end of a lever, *i*, whose other end engages with a pawl, E. This gage *b′* is raised by a bar, *t*, connected with an arm of the rock-shaft N, the slot in the upper end of the bar *t* allowing the gage to drop more or less, as is required, according to the height of the topmost sheet of paper. If this is too high, the gage will not drop so low, which causes the pivoted lever *i* to throw the pawl E out of engagement with the ratchet-wheel F′, attached to the screw F; but if the paper is not fed up sufficiently high, the gage drops lower and permits the lever *i* to move the pawl into engagement with the ratchet, and the paper is then moved up higher. This operation is

precisely the same as is described in the Letters Patent before mentioned, dated September 10, 1878.

The operation of the mechanism for moving the sheets from the pile is as follows: A pile of paper being laid upon the platform, and the shafts B and B′ being made to revolve, if the topmost sheet is in position to be taken off, the end of the gage b' rests upon the sheet, holding it firmly, while the friction-pad a^2 pushes the corner of the sheet beneath it inward, raising that part of the topmost sheet which is just in front of the separator m' a little above the pile. This separator m' then moves forward beneath that part of the sheet, and at the same time the gage b' is raised from the paper. The friction-starter a^1 then moves down and forward upon that part of the sheet which is above the separator m', causing a larger portion of the sheet to bend upward, and the separator m then moves forward beneath the sheet, the pad or starter f^2, which rests upon the paper, and the pusher n bearing against the rear edge of the sheet, operating to move the latter off the pile sufficiently far to be caught between the rolls M and be carried away. As the separator moves back again the trip f^1, dragging upon the paper in the pile, is moved into a vertical position, and the rod f and pad f^2 are slightly raised, so that the sheet is not moved from its position until it is properly separated from the pile as before.

In practice it is found that in feeding ordinarily-thick sheets of paper the pusher n is quite sufficient to move the sheet from the pile; but for feeding thin or very flexible sheets the auxiliary starter f^2 greatly assists the operation of feeding uniformly.

Having thus described my invention, what I claim as new is—

1. The combination, in a machine for feeding paper, of the friction-starters a^2 and a^1 and the separators m and m', substantially as and for the purpose specified.

2. The combination, in a machine for feeding paper, of the friction-starters a^2 and a^1, the separators m and m', and the gage b', substantially as described.

3. The combination, in a machine for feeding paper, of the friction-starters a^2 and a^1, the separators m and m', and the auxiliary starter f^2, operating substantially as described.

4. The combination, in a machine for feeding paper, of the friction-starters a^2 and a^1, the separators m and m', and the pusher n, substantially as set forth.

5. The combination, in a machine for feeding paper, of the friction-starters a^2 and a^1, the separators m and m', the pusher n, and the auxiliary starter f^2, substantially as and for the purpose described.

6. The combination, in a machine for feeding paper, of the friction-starters a^2 and a^1, the separators m and m', the pusher n, the auxiliary starter f^2, and the gage b', substantially as and for the purpose described.

7. In a machine for feeding paper, the gage b', adapted to rest upon the paper and, by its connection with a pawl, to regulate the upward movement of the paper-platform, and also adapted, in combination with a friction starter or pad, a^2, to fold or bend the paper so that it may be easily separated and removed from the pile, substantially as set forth.

LUCIUS HARLOW.

Witnesses:
T. A. CURTIS,
A. D. COPELAND.