

T. J. MAYALL & R. W. HARTNETT.

Delivering-Apparatus for Printing-Presses.

No. 159,947.

Patented Feb. 16, 1875.

Fig. 1

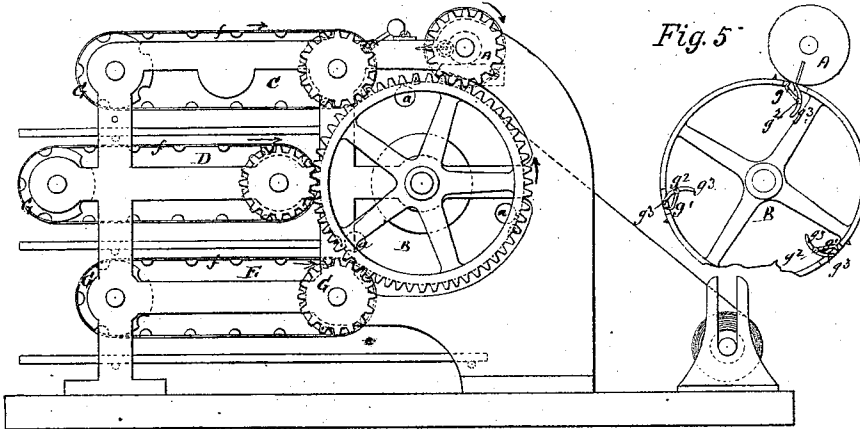


Fig. 5

Fig. 2

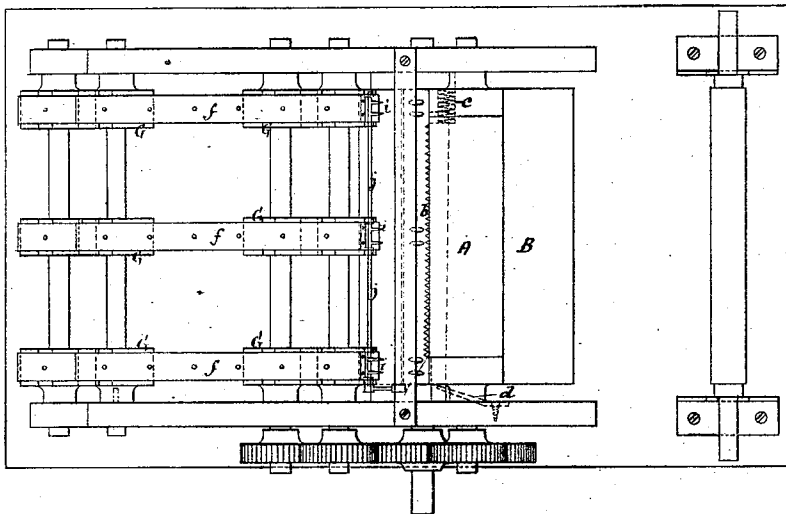


Fig. 3

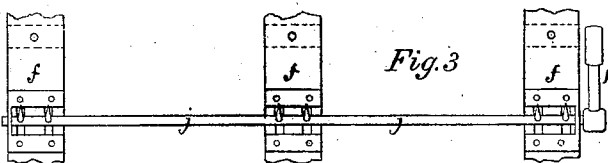
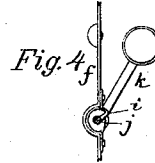


Fig. 4



Witnesses:

Ewell & Sons  
J. M. Wood

Inventors:

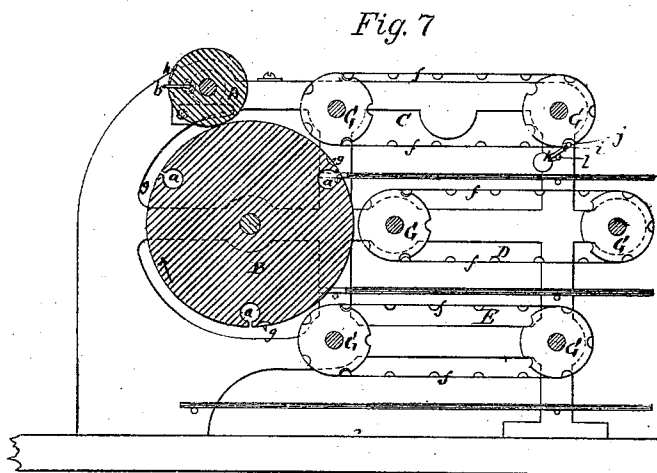
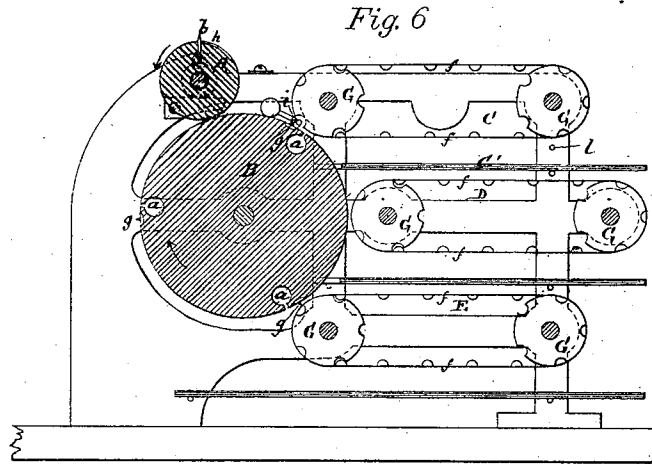
Thos. J. Mayall and  
Richd W. Hartnett  
attn: Adolphe

T. J. MAYALL & R. W. HARTNETT.

Delivering-Apparatus for Printing-Presses.

No. 159,947.

Patented Feb. 16, 1875.



Witnesses:

Everett A. Dick  
J. M. Pool

Inventors:

Thomas J. Mayall and  
Rich<sup>d</sup> W. Hartnett by  
attn Hollister

# UNITED STATES PATENT OFFICE.

THOMAS J. MAYALL AND RICHARD W. HARTNETT, OF BOSTON, MASSACHUSETTS, ASSIGNORS TO THE MAYALL POWER PRINTING-PRESS COMPANY, OF NEW YORK, N. Y.

## IMPROVEMENT IN DELIVERING APPARATUS FOR PRINTING-PRESSES.

Specification forming part of Letters Patent No. **159,947**, dated February 16, 1875; application filed December 12, 1874.

*To all whom it may concern:*

Be it known that we, THOMAS J. MAYALL and RICHARD W. HARTNETT, both of Boston, Suffolk county, Massachusetts, have invented certain new and useful Improvements in Delivering Apparatus for Printing-Presses, of which the following is a specification:

This invention relates especially to the delivery or apparatus for delivering the sheets from the press.

The object we have in view is to provide means whereby the sheets may be delivered with greater certainty and more rapidly than has heretofore been practicable. We employ, for the purpose of dividing the endless paper band into sheets, a knife-cylinder and a counter or female cylinder. The band passing between these two cylinders is divided by the knife into sheets.

This combination of cylinders is, of course, not new with us; nor is it new to combine with such cylinders one delivery or two deliveries, for the purpose of taking the sheets from the female cylinder. This operation, however, has heretofore been effected by means of nippers. There is, however, objection to the use of nippers. They do not act with certainty. The press cannot be run beyond a certain rate of speed—less than that which it might otherwise be practicable to attain—without increasing their liability to fail; they and their operating mechanism are liable to get out of order; and a very delicate and accurate adjustment must be obtained and retained in order to keep this part of the press in running order.

To obviate these objections we provide the female cylinder with a series of pins or hooks located just in rear of the knife-slot in said cylinder, which pins, by the action of the knife-cylinder, are pressed into and through the paper, and serve to retain the front end of the sheet on the female cylinder until said sheet is taken off therefrom by the delivery. With the female cylinder, thus provided with retaining pins or hooks, we combine one or more deliveries, each provided with hooks,

which operate automatically to pick the sheet from the retaining-pins on the female cylinder, and to carry the sheet on the delivery-tapes until the same is removed therefrom by the fly.

In the accompanying drawing, Figure 1 is a side elevation of our delivery apparatus. Fig. 2 is a plan of the same. Fig. 3 is a plan of a portion of our delivery, on an enlarged scale, designed to show the hooks that pick off the sheets from the cylinder. Fig. 4 is a side elevation of a portion of one of the tapes and the hooks carried by the same. Fig. 5 is an end elevation of the cutting and female cylinders, representing a modification of the devices for retaining the paper on the lower cylinder. Figs. 6 and 7 are vertical longitudinal sections of the apparatus, representing the cutting and delivery apparatus in different positions, hereinafter explained.

The knife or cutting cylinder is shown at A, the female cylinder at B with knife-slots *a*. These two cylinders are geared to move in unison, and are in contact. Between them passes the endless printed paper strip, which is conveyed to them from the perfecting press in any ordinary or suitable way.

The serrated knife is shown at *b*. Its movement in the direction of its length, for the purpose of shearing the paper, is produced by arranging it on the cylinder A, so that it can slide lengthwise therein, and, by combining with it a spring, *c*, which presses it in one direction, and a cam, *d*, on the frame of the machine, which at the proper time during the revolution of the cylinder acts on the opposite and projecting end of the knife, to force it quickly and for a short distance in the other direction against the pressure of the spring. In furtherance of the object of this arrangement, the knife is also arranged so that its serrated edge will project a little further beyond the periphery of the cylinder at the end next the cam than at the opposite end, as indicated in Fig. 2.

The effect of this arrangement of parts is that the knife, at the moment it is brought in

contact with the paper for the purpose of severing it, will deliver a draw-cut, which will leave the sheet with a sharp smooth edge instead of the ordinary ragged and serrated edge.

The size of the female cylinder is proportionate to the number of deliveries used. In this instance three deliveries, C D E, are shown. We consequently make the female cylinder three times the circumference of the male or cutting cylinder A, and provide it with three knife-slots, *a*, equidistant from one another. The female cylinder will, therefore, deliver three sheets during a single revolution.

The deliveries C D E are each composed of endless tapes *f* running over drums G in the usual way, the drums being driven at proper speed, to cause each delivery in its proper turn and order to take a sheet from the cylinder B. The front drums of the deliveries are arranged so that their tapes will run nearly in contact with the female cylinder. The direction of rotation of the two cylinders and the three deliveries is indicated by arrows.

Immediately in rear of each knife-slot *a* in the female cylinder is set a row of pins, *g*, whose points project a little beyond the periphery of the cylinder. The knife-cylinder A is formed on its periphery, in rear of the knife, with a cushion, *h*, of rubber, or other material, which, during the rotation of the cylinders, meets the pins *g*, and forms a bed, which presses on the pins to cause them to penetrate the paper.

This operation takes place at about the time the knife acts on the paper, so that simultaneously, or nearly so, with the severing of the paper the pins take hold of the front edge of the paper in rear of the sheet just severed, and, holding that edge close to the cylinder, carry the paper around toward the delivery, as indicated in Fig. 1, until this held edge of the paper reaches the delivery, as in Fig. 6, where the topmost delivery C is represented as just about to take the paper. When in this position, the hooks *i* on the delivery-tapes (hereafter described) enter this edge of the paper, and, the rotation of the cylinders and delivery continuing, strip it from off the pins *g*. The front end of the paper is now transferred from the cylinder to the under side of the first delivery, along which it is carried by the hooks, which move with the tapes. The continued rotation of the two cylinders A B now bring the knife opposite to the paper between them, and cause it to sever the paper, and a sheet is thus formed, the rear end of which passes from the female cylinder to the tapes, being there drawn by the action of the hooks above described. As soon as this sheet is fairly within the compass of the delivery, it is knocked down onto the table or platform C' by a fly, (not shown

in the drawing,) the hooks *i* being withdrawn from the paper simultaneously with the descent of the fly.

Under the arrangement shown in the drawing of three deliveries, the tapes of each delivery are of such length that, while moving in unison with the cylinders, so as not to strain the paper, their hooks will come opposite to and take every third sheet. The paper sheets are carried to either one of the three deliveries with perfect safety and accuracy, for their front ends will always be held by means of the pins *g* until the hooks belonging to the particular delivery which is to take the sheet strip the sheet from the pins.

In the drawing we have shown but one of the deliveries provided with stripping-hooks. Each delivery is the counterpart of the other, so that a description of the hooks for one will answer for all.

The hooks *i* project from and are carried by a transverse rock-shaft, *j*, supported in bearings on the delivery-tapes, as indicated in Fig. 3. On one end of the shaft is a weighted arm, *k*, that, when the hooks are passing down around the front drums G, drops over, so as to project the hooks from the tapes, as seen in Fig. 1; before said hooks reach the point where they are to strip the paper from the pins. The hooks remain thus projected until they arrive at about the point indicated in Fig. 7, where they are to drop the paper. At this point the arm *k* runs over a pin or cam, *l*, which tilts the arm, and consequently causes the shaft to rock to a sufficient extent to withdraw the hooks into recesses in the tapes, and so to disengage them from the paper.

This is one simple arrangement of hooks which has been shown to illustrate our invention.

We do not limit ourselves, however, to the special devices shown for moving the hooks, as various devices can be employed for the purpose, and in lieu of a single shaft, *j*, each tape may carry its own hook or hooks, which may be operated by mechanism independent of that operating the hooks on the other tapes.

In lieu of the pins *g* we can employ hooks *g*<sup>1</sup>, on rock-shafts *g*<sup>2</sup>, within the female cylinder, as indicated in Fig. 5, each rock-shaft having wiper-arms *g*<sup>3</sup>, arranged to be operated by cams, which will project the hooks from the cylinder to take hold of the paper, and will withdraw them again into the cylinder at the time when the paper is taken hold of by the stripping-hooks on the delivery-tapes. We prefer, however, the simple pins first above described.

The action of the mechanism we have described is positive and unerring in accuracy. It admits of the press being run at its utmost speed, and will take the sheets at any speed.

The number of deliveries can be increased

indefinitely, thus adapting the apparatus for use with any perfecting-press, and allowing that press to be run to its full capacity.

What we claim, and desire to secure by Letters Patent, is—

In combination with the female cylinder, provided with pins, or the equivalents specified, arranged to operate, as described, one or more deliveries, armed with stripping-hooks, for operation in connection with said pins,

substantially in the manner and for the purposes sent forth.

In testimony whereof we have hereunto signed our names this 25th day of November, A. D. 1874.

THOS. J. MAYALL.

RICHD. W. HARTNETT.

Witnesses:

EWELL A. DICK,

HENRY R. ELLIOTT.