(No Model.) 2 Sheets—Sheet 1.

R. W. JAMIESON.

SHEET DELIVERY MECHANISM FOR PRINTING PRESSES.

No. 597,114. Patented Jan. 11, 1898.

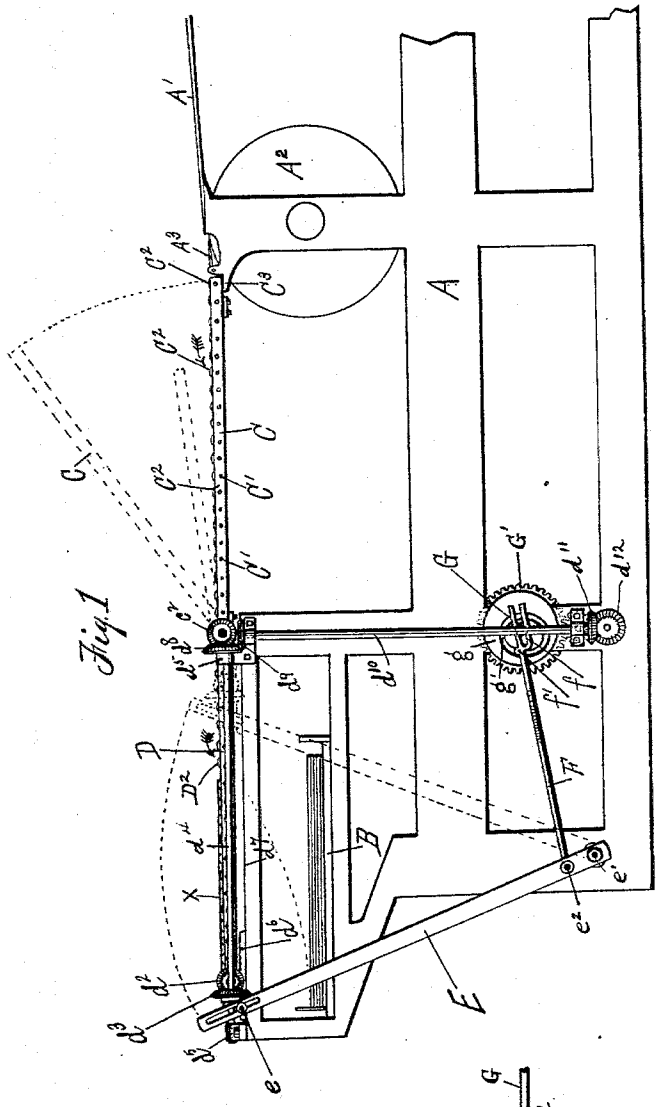


Fig. 1

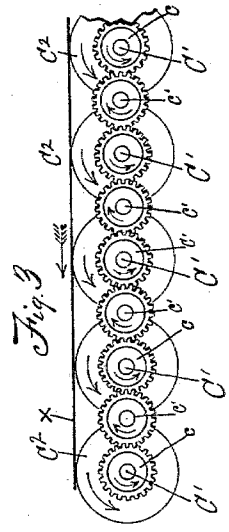


Fig. 3

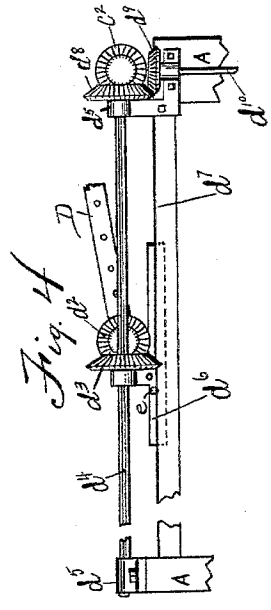


Fig. 4

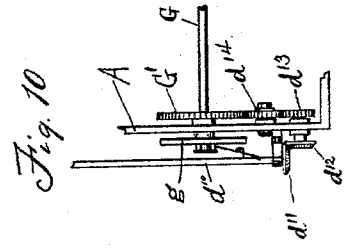


Fig. 10

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(No Model.) 2 Sheets—Sheet 2.

R. W. JAMIESON.

SHEET DELIVERY MECHANISM FOR PRINTING PRESSES.

No. 597,114. Patented Jan. 11, 1898.

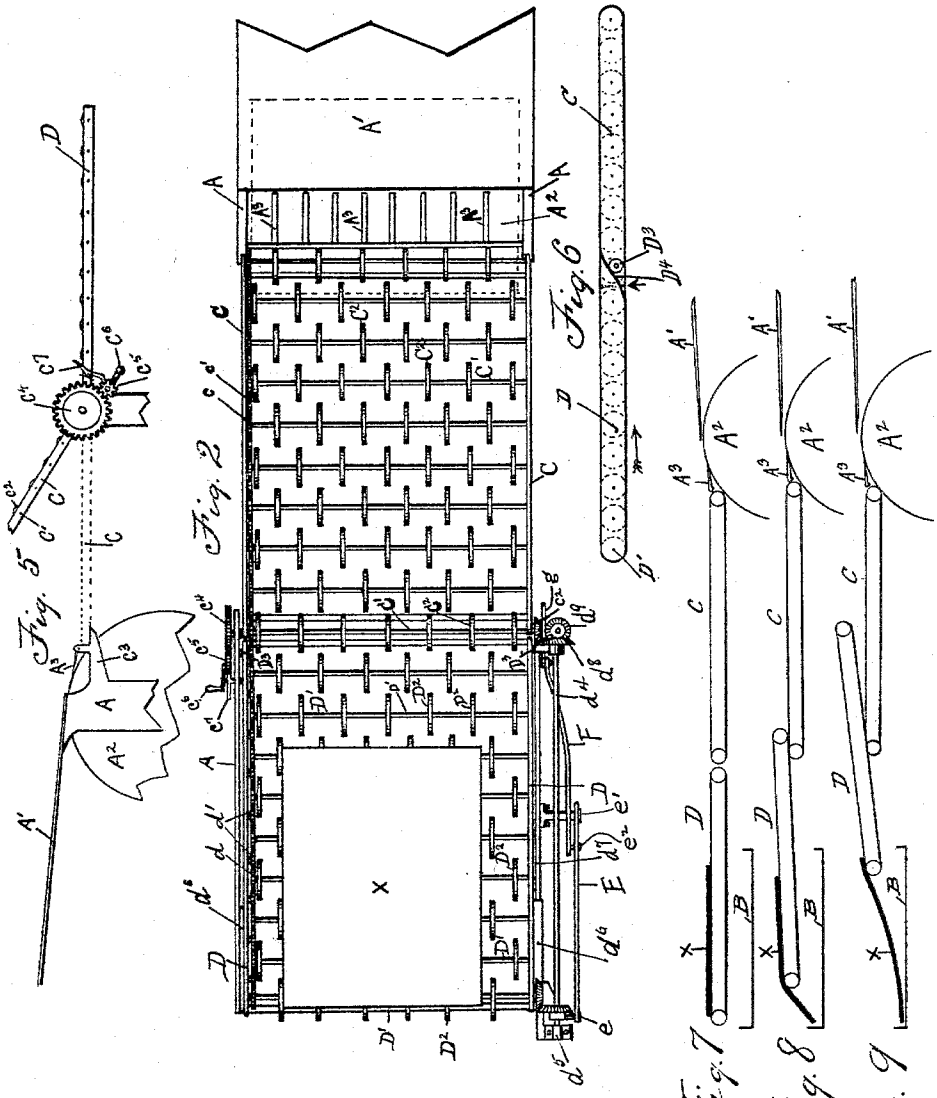


Fig. 5

Fig. 2

Fig. 6

Fig. 7 Fig. 8 Fig. 9

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SHEET-DELIVERY MECHANISM FOR PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 597,114, dated January 11, 1898.

Application filed February 13, 1896. Serial No. 579,113. (No model.)

To all whom it may concern:

Be it known that I, ROBERT W. JAMIESON, a citizen of the United States, and a resident of the city of Rochester, in the county of Monroe and State of New York, have invented certain new and useful Improvements in Sheet-Delivery Mechanism for Printing-Presses, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a press-frame having my device applied thereto. Fig. 2 is a top plan view thereof. Fig. 3 is a view showing the gearing of the delivery-rolls. Fig. 4 is a side view of the driving mechanism of the movable bed of rolls. Fig. 5 is a side view of the mechanism for tilting the stationary bed of rolls. Fig. 6 is a side view of a portion of the frame of the apparatus; and Figs. 7, 8, and 9 are diagrams showing the operation thereof. Fig. 10 is a top plan view of a part of the driving mechanism.

The object of my invention is to provide a sheet-delivery mechanism for printing-presses, which, among other points of advantage, may be free from the mechanical difficulties incident to the use of tapes or bands and incident to the use of grippers, the same being, among other things, positively driven throughout and free from slip or lost motion. I attain these objects and other results herein described by the mechanism hereinafter set forth and claimed.

In the drawings, A is the frame of the printing-press provided with the usual feed-table A′ and the impression-cylinder A^2.

B is the usual delivery-table.

C is a frame bearing a series of transverse shafts C′, each of which bears a series of rollers C^2. Of course a continuous roller extending from side to side is equivalent to the series of rollers C^2 on a single shaft. The frame C is pivoted to the frame A—as, for instance, on the shaft C′ at the extreme end of the frame. The end of the frame C normally rests upon a ledge C^3 on the frame A. Between the impression-cylinder A^2 and the first rollers C^2 there are a series of stripper-fingers A^3, which take the leading edge of the sheet from the impression-cylinder as soon as it is released by the usual grippers and guide the sheet to the rollers C^2. The shafts C′ are severally provided with gear-wheels *c*, which are geared together by the idlers *c*′, so as to cause the shafts C′ all to revolve in the same rotary direction and with the same speed. On one side of the frame C, at the end most remote from the impression-cylinder A^2, is fixed a gear-wheel C^4, Figs. 2 and 5, with which meshes a pinion C^5, operated by a crank-handle C^6, and a pawl C^7 engages the pinion or the gear-wheel C^4. Upon rotating the pinion C^5 the frame C may be lifted from the ledge C^3 around its pivotal axis, so as to give access to the interior mechanism of the press, the inaccessibility of the interior parts of the present presses, and particularly the inking-rollers, being due in great part to the immobility of that part of the delivery mechanism adjacent to the impression-cylinder. The engagement of the pawl C^7 enables the frame C to be held in its lifted position at such angle as may be desired.

In continuation of the frame C is a second frame D, bearing transverse shafts D′, carrying rollers D^2, like the frame C. The shafts D′ are driven by gears *d d*′, exactly like the shafts C′ of the frame C. The frame D′, however, is movable and reciprocates toward and from the impression-cylinder A^2. When the frame D is in its extreme position over the receiving-table B, the two frames C and D are in line and the upper surfaces of their rollers C^2 and D^2 are in the same plane, as shown in Figs. 1 and 2. Upon the end of the frame C most remote from the impression-cylinder are a pair of antifriction-wheels D^3 in line with the side pieces of the frame D, and the ends of the frame D nearest to the impression-cylinder A^2 are beveled to form a track D^4, (see Fig. 6,) whereby when the frame D moves in the direction of the arrow in Fig. 6 it will be lifted and ride back upon the rollers D^3. The frame D is pivoted on the shaft D′ most remote from the impression-cylinder, and thus is free to rise over the rollers D^3 at the end nearest to said cylinder. The shaft D′, on which the frame D is pivoted, bears a beveled gear d^2, which meshes with another beveled gear d^3, which is splined upon a rotating shaft d^4, which is set in stationary boxes d^5 on the frame A. A carriage d^6 carries a bearing for the beveled gear d^3 and slides on a way d^7, parallel to the shaft D^4, and thus

supports the end of the frame D, which is most remote from the impression-cylinder. One of these carriages d^6 is set on each side of the frame D to support and to guide the end of the frame most remote from the impression-cylinder during the reciprocating movements. The shaft d^4 is driven by beveled gears d^8 d^9 and a shaft d^{10}, which shaft is driven from the driving-shaft of the machine. The shaft C′ of the frame C most remote from the impression-cylinder is driven by a bevel-gear c^2, meshing with the gear d^8.

In order to cause the frame D to reciprocate, I pivot on the side of the frame A a lever E, which by pin-and-slot connection e is attached to one or both of the carriages d^6. Two such levers may be employed, one on each side of the machine. This lever is reciprocated by a pitman F, having a yoke f on the end thereof straddling a shaft G, which is driven in exact time with the revolutions of the impression-cylinder A^2. On the shaft G is a disk g, having the eccentric cam-slot g' on one side thereof, into which extends a pin f' on the pitman F and actuates the pitman and the lever. This causes the frame D to reciprocate and in so doing to ride up over the frame C, as shown in Figs. 8 and 9. The cam-slot is so formed that the frame D remains stationary in the position most remote from the cylinder A^2 during such period of time as is necessary to receive the sheet from the rolls C^2 and to convey it to the end of the bed of rolls D^2, this latter position of the sheet being shown in Fig. 1. The shaft G has a driving gear-wheel G′, Figs. 1 and 10, upon it, which through the gears d^{14} and d^{13} drives a bevel-gear d^{12}, which drives another bevel-gear d^{11} on the shaft d^{10}. The rolls are geared up to the requisite rotary speed by this system of gears.

The rollers C^2 and D^2 are driven constantly in the direction of the arrows in Fig. 1. As soon as the leading edge of the sheet X leaves the impression-cylinder it passes upon the stationary bed of rolls C, but is moved onward thereon by the revolution of the rollers. From the stationary bed C it is moved by the rollers to the bed D, and as soon as the leading edge of the sheet reaches a point, as shown in Fig. 1, over the delivery-table the lever E begins to move the frame D toward the impression-cylinder, while the revolution of the rolls D^2 feeds the sheet X off the rollers D^2 and deposits it, printed side up, upon the delivery-table. The revolution of the rolls D^2 delivers the sheet from the rolls with the same speed as is given to the frame D in its backward movement toward the impression-cylinder A, so that the sheet X is relatively stationary with reference to the impression-table during delivery thereto, and the frame D moves out from under the sheet. The frame D tilts upward in this movement, passes above the bed of rollers C^2, and by thus tilting enables the sheet X the more easily to pass off the rollers to the delivery-table. (See Figs. 8 and 9.) As soon as the frame D is moved to its limit the sheet X is fully delivered therefrom and it is returned to its other position. While the sheet X is being delivered from the rolls D^2 another sheet may be delivered from the impression-cylinder A^2 to the rolls C^2 and may pass to the rolls D^2 as soon as the frame D has reached the position shown in Fig. 1; but ordinarily the impression-cylinder makes two revolutions for each sheet delivered, and in such case the frame D may move to its position away from the cylinder during the revolution of the latter when the sheet is not delivered therefrom.

It is well known that the tapes heretofore used in delivery mechanisms for printing-presses are constantly stretching and sagging and that the stretching of individual tapes will differ from the stretching of others in the same machine, thereby producing an uneven delivery of the sheets and permitting them to bend and wrinkle; that the tapes often break, necessitating a stoppage of the press for repairs, and that the broken tapes fall upon the type-bed below and are led between the type-bed and the impression-cylinder before the machine can be stopped, and thus frequently injure the type and in particular damage expensive engravings or blocks for printing illustrations; that dirt of the various kinds existing about a press clings to the uneven surface of the tapes, and that they are difficult to clean. In order to obviate these serious and practical difficulties, I employ the novel feature in a delivery mechanism of one or more beds of driven rolls instead of tapes. The rolls remain constant in form and in level, are very easily cleaned, and, not having the rough surface of the tapes, do not catch the dirt with equal facility; and in the use of tapes lint therefrom is constantly being produced and is constantly dropping upon the type-bed underneath, thereby clogging the type and interfering with proper printing.

Of course friction-gearing is an equivalent for the spur-gearing c' c^2 and d' d^2.

I do not intend to limit my claims to any greater extent than their terms necessarily imply.

What I claim is—

1. The combination of an impression-cylinder; a delivery-table; a stationary bed of constantly-driven rolls for receiving the sheet from the cylinder; and a tilting bed of constantly-driven rolls for receiving the sheet from the stationary bed and delivering it to the delivery-table.

2. The combination of an impression-cylinder; a delivery-table; a stationary bed of constantly-driven rolls for receiving the sheet from the cylinder; and a reciprocating and tilting longitudinally-moving carriage provided with means adapted to move the sheet thereon for receiving the sheet from the stationary bed and delivering it to the delivery-table.

3. The combination of an impression-cylin-

der; a delivery-table; a stationary bed of constantly-driven rolls for receiving the sheet from the cylinder; and a reciprocating and tilting bed of constantly-driven rolls for receiving the sheet from the stationary bed and delivering it to the delivery-table.

4. The combination of an impression-cylinder; a delivery-table; a stationary bed of rolls constantly driven in one direction; and a reciprocating frame, movable into the same plane with the stationary bed to receive the sheet therefrom, and moving backward out of said plane to deliver the sheet therefrom, and provided with devices for constantly moving the sheet resting thereon to the delivery-table.

5. The combination of an impression-cylinder; a delivery-table; a constantly-operating mechanism, propelling the sheet toward the delivery-table, for receiving the sheet from the cylinder; and a constantly-driven movable mechanism for receiving the sheet from the first mechanism and for delivering it to the delivery-table, said second mechanism being adapted to tilt and to pass above said first mechanism.

6. The combination of an impression-cylinder; a delivery-table; and a constantly-driven but stationary mechanism, for receiving the sheet from the cylinder; a reciprocating bed of constantly-driven rolls, movable into the same plane with the stationary mechanism to receive the sheet therefrom, and reciprocating toward the impression-cylinder to deliver the sheet to the delivery-table, and transversely pivoted at the end most distant from the impression-cylinder; means for guiding the other end of said reciprocating bed above the stationary bed; whereby the reciprocating bed is tilted to deliver the sheet therefrom to the delivery-table.

7. The combination of an impression-cylinder; a delivery-table; stationary mechanism for moving the sheet thereon and therefrom for taking the sheet from the cylinder and for delivering the sheet from said mechanism; a carriage provided with means for moving the sheet thereon and therefrom and mechanism for moving the carriage to and from the delivery-table and into and out of the plane of delivery of said sheet from said stationary mechanism.

8. The combination of an impression-cylinder; a delivery-table; stationary mechanism for moving the sheet thereon and therefrom for taking the sheet from the cylinder and for delivering the sheet from said mechanism; a carriage provided with means for moving the sheet thereon and therefrom and mechanism for moving the carriage to and from the delivery-table and into and out of line with said stationary mechanism.

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Witnesses:
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