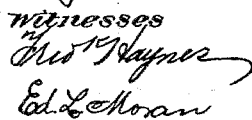


C. B. COTTRELL.

No. 305,797.

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DELIVERY APPARATUS FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 305,797, dated September 30, 1884.

Application filed May 3, 1883. (No model.)

To all whom it may concern:

Be it known that I, CALVERT B. COTTRELL, a citizen of the United States, and a resident of Stonington, in the county of New London and State of Connecticut, have invented a new and useful Improvement in Delivery Apparatus for Printing-Machines, of which the following is a specification.

My invention is applicable both to two-revolution and stop-cylinder presses; and it relates to front sheet-delivery apparatus, by which the sheet is taken from the cylinders, floated or "kited" over the inking apparatus, and delivered printed side up.

The invention consists in the combination, with an impression-cylinder capable of rotation in one direction only for printing, and a feed-board at the back of the cylinder, of chain-wheels arranged at the front of the cylinder, a receiving-table at the farther end of the press, chain-wheels adjacent to said receiving-table, endless chains passing around said chain-wheels, and a gripper-bar and gripper-rod extending between and connecting said chains, and provided between the chains with gripper-fingers, the said chains being capable of movement in but one direction to take the printed sheet from the cylinder and carry it over the inking apparatus and to said receiving-table; also, in combination with the aforesaid cylinder, endless chains, and grippers, of mechanism for driving the chains at a greater velocity than the cylinder, so as to float or kite the sheet over the inking apparatus.

The invention also consists in the combination, with the cylinder of a two-revolution press capable of a rising and falling movement, and a feed-board at the back of the cylinder, of chain-wheels arranged at the front of the cylinder and supported from the bearings of the cylinder, a receiving-table at the farther end of the press, chain-wheels adjacent to the receiving-table, endless chains passing around said chain-wheels, and a gripper-bar and gripper-rod provided with gripper-fingers extending between and connecting said chains, said chains being capable of movement in one direction only to take the printed sheet from the cylinder over the inking apparatus and to said receiving-table.

The invention also consists in the combination, with the cylinder, endless chains, a gripper-rod, and grippers, of mechanism for imparting a rising and falling motion to the chains at their outer ends, whereby the chains, as the sheets approach and come over the receiving-table, are lowered, and the heads of the sheets are placed on the pile. This is advantageous, because it enables the sheets to be carried high over the inking apparatus and still avoids dropping or releasing the sheets at any considerable distance above the receiving-table.

In the accompanying drawings, Figure 1 is a side elevation of such parts of a two-revolution press as are necessary to illustrate my invention. Fig. 2 is an end elevation thereof. Figs. 3 and 4 are detail views upon a larger scale, showing the construction of the chains, the grippers, and their appurtenances. Fig. 5 is a plan of a portion of one chain and gripper-bar on the same scale as Figs. 3 and 4, and Fig. 6 is a detail view hereinafter described.

Similar letters of reference designate corresponding parts in all the figures.

A designates the main frame of the press, and B designates the cylinder, which is rotated in one direction only for printing.

C designates the endless chains, of which two are employed—one at each end of the cylinder. These chains are supported at their inner ends, at the front and near the top of the cylinder B, by chain-wheels *a*, and they are supported at their outer ends upon corresponding chain-wheels, *b*. The inner pair of wheels, *a*, are mounted on a shaft, *c*, which is supported in standards *d*, as shown in Fig. 3, and the outer wheels, *b*, are mounted on a shaft, *e*, which is capable of rising and falling in standards or guides *g*, as shown in Fig. 1. Behind and at the top of the cylinder B is the feed-board B*.

In two-revolution presses, in which the main cylinder B has necessarily a slight rising and falling movement, the standards *d*, which support the shaft *c*, should be connected with the bearings of the cylinder, so as to rise and fall with the cylinder. When the endless chains C have but one set of delivery-grippers, as hereinafter described, they should be of such length that they will make one complete cir-

cuit during the two revolutions of the cylinder, if employed in a two-revolution press, or during one revolution and a stop if employed in a stop-cylinder press. In this example of

5 my invention the shaft *c* is geared to the cylinder by means of a gear-wheel, *h*, which engages with a pinion, *i*, on the shaft *c*, which is shown in Fig. 3. The relative sizes of the wheel *h* and pinion *i* and the cylinder *B* and chain-wheels *a* are such that the chains will
10 move somewhat faster than the cylinder, and will therefore carry or float the sheets over the inking apparatus, of which I have here shown an arbitrary illustration, *S*, Fig. 1.

15 In a stop-cylinder press the shaft *c* would have to be operated from a continuously-rotating shaft, instead of from the cylinder.

The chains *C* are represented in Figs. 3 and 4 as composed of links which are approximately semicircular in shape, and which engage with the wheels *a* *b*.

I will now describe the gripper mechanism shown in Figs. 3, 4, and 5.

In each chain *C* is a single gripper-block, 25 *C'*, which is notched or recessed so as to engage with the chain-wheels *a* *b*, and the gripper-blocks of the two chains are connected by a gripper-rod, *j*, carrying gripper-fingers or grippers *k*, and also carrying an arm, *l*, at one end. The blocks are also connected by a bar, 30 *m*, upon which the gripper-fingers close, and when not otherwise acted upon the fingers are held closed on the bar *m* by the usual closing-spring, *n*, applied to the gripper-rod *j*, as shown in Fig. 5. As the gripper-blocks *C* pass 35 around the wheels *a*, as shown in Fig. 3, they are opened to take the sheet by the arm *l* bearing upon a stationary cam-surface, *o*, and as soon as the arm passes said cam the grippers are closed on the sheet by the action of the spring *n*. The sheet will then be carried outward from the cylinder, as shown at *p*, Fig. 1, and as the gripper-blocks *C'* approach the wheels *b* the arm *l* comes in contact with a 45 fixed cam or projection, *q*, on the standard *g*, and the grippers are thereby opened to release the sheet.

As before stated, the outer shaft, *e*, is capable of sliding upward and downward in the standards *g*, and it is journaled in bearings 50 carried by rods *D*, which are connected to arms *E* upon a rock-shaft, *F*.

Upon the rock-shaft *F* is secured a third arm, *o'*, to which is attached a rod, *F'*, which 55 is provided with a roller or bowl, *s*, and is moved longitudinally by a cam, *t*, on a shaft, *u*, which may be rotated by any suitable mechanism.

The mechanism just described serves to 60 raise the shaft *e* and the chains, but they fall, when released, by their own weight. During the outward movement of the sheet the chains are in their highest position, as shown in full lines in Fig. 1; but as the sheet reaches the 65 receiving-table *G* the chains are suddenly low-

ered by the action of the cam *t* and the intermediate mechanism, and are brought almost down to the pile of sheets on the receiving-table. The head of the sheet is then released 70 by the opening of the grippers, and the sheet settles squarely on the pile.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a printing-press, the combination, with an impression-cylinder capable of rotation in one direction only for printing, and a feed-board at the back of the cylinder, of chain-wheels arranged above and at the front of the cylinder, a receiving-table at the farther end 75 of the press, chain-wheels adjacent to said receiving-table, endless chains passing around said chain-wheels, and a gripper-bar and gripper-rod extending between and connecting said chains, and provided between the chains with gripper-fingers, said chains being capable of movement in one direction only to take 80 the printed sheet from the cylinder and carry it over the inking apparatus and to the receiving-table, substantially as herein described.

2. The combination, with the cylinder of a printing-press, of endless chains extending from the front of the cylinder to a receiving-table at the farther end of the press, a gripper-rod carrying delivery-grippers, and extending 85 between and supported and carried by the chains, and mechanism, substantially such as described, for driving the chains at a greater velocity than the surface velocity of the cylinder, substantially as herein specified. 90

3. The combination, with the cylinder of a two-revolution press capable of a rising and falling movement, and a feed-board at the back of the cylinder, of chain-wheels arranged at the front of the cylinder and supported from 95 the rising and falling bearings of the cylinder, a receiving-table at the farther end of the press, chain-wheels adjacent to the receiving-table, endless chains passing around said chain-wheels, and a gripper-bar and gripper-rod extending between and connecting said chains, and provided between the chains with gripper-fingers, said chains being capable of movement 100 in one direction only to take the printed sheet from the cylinder and carry it over the inking apparatus and to said receiving-table, substantially as herein described. 105

4. The combination, with the cylinder of a printing-press, of endless chains extending from the front of the cylinder, a gripper-rod 110 carrying delivery-grippers and extending between said chains, and mechanism, substantially such as described, for imparting a rising and falling movement to the said chains, substantially as herein specified. 115

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Witnesses:

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