J. T. HAWKINS.

Delivery Apparatus for Printing-Machine.

No. 221,458. Patented Nov. 11, 1879.

Fig 2

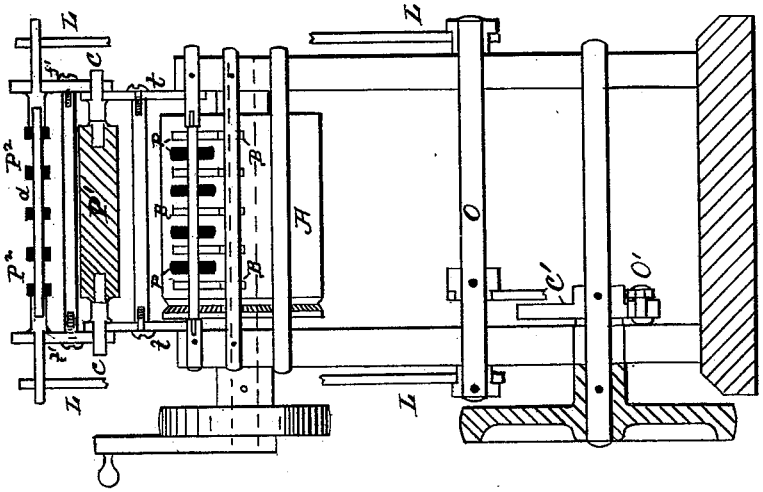
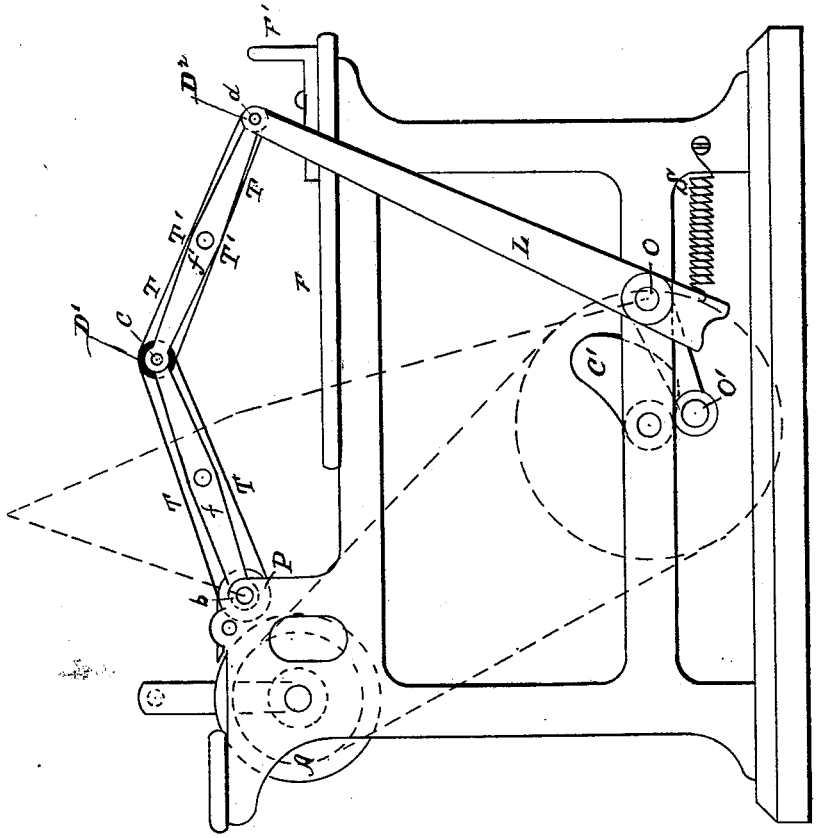


Fig 1



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JOHN T. HAWKINS, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN DELIVERY APPARATUS FOR PRINTING-MACHINES.

Specification forming part of Letters Patent No. **221,458**, dated November 11, 1879; application filed February 17, 1879.

To all whom it may concern:

Be it known that I, JOHN T. HAWKINS, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Delivery Apparatus for Printing-Presses, which improvement is fully set forth and illustrated in the following specification and accompanying drawings.

The object of this invention is to deliver sheets of paper from a printing-press in a regular pile with the side last printed upward and without bringing this last-printed side of the sheet in contact with tapes, ply, or any other part of the delivery mechanism.

As printed sheets come from contact with the "form" and before opportunity to become dry, they are easily blurred and defaced, if, in the process of delivery, the side last printed be allowed to come into contact with any part of the mechanism constituting the delivery apparatus.

In all devices heretofore employed whereby the sheets are deposited with the side last printed uppermost, and thus subject to the continuous inspection of the pressman, this last-printed side comes in contact either with moving tapes, cords, or fly-fingers, except when the sheet is taken from the cylinder-gripers by carrying-gripers and deposited by the latter gripers upon the delivery-board; and although the delivery of printed sheets without contact of the last-printed side with any part of the delivery mechanism has already been accomplished, yet in all such cases, with the exception above noted, said sheets are delivered with the last-printed side downward. Now, as it is very desirable that the work should be under constant inspection while in progress, the object sought in this invention, as above mentioned, is not only to deliver the sheets without the contact of the last-printed side with the delivery mechanism, but also with said last-printed side uppermost at the same time.

In pursuance therefore of the object above mentioned, this invention consists in combining with a printing-press or other machine for delivering sheets of paper in a regular pile, a vibrating double-hinged frame provided with suitable shafts, pulleys, and tapes or cords, which frame receives, by virtue of its double-hinge construction, a folding or closing-and-opening motion from some suitable moving part of the machine, each printed sheet coming in contact with said tapes, cords, or pulleys only on its blank or dry side. The delivering end of this frame is given a retrograde motion at a velocity equal to that with which the tapes move upon it, said end thus moving from under the sheet while depositing it, and permitting it to settle down upon the pile easily and without one sheet sliding upon another.

In the accompanying drawings Figures 1 and 2 show, respectively, in side and end elevation, a form of press which delivers the sheet from the top of the cylinder and toward the front of the machine.

In Fig. 2, in order the more clearly to show the hinged construction of the fly-frame, the shaft *d* is shown elevated above the shaft *c*, which position is the reverse of that which it would occupy if truly projected graphically from its position in Fig. 1.

In these figures the printing-cylinder is designated by the letter A. B B designate a series of bridges upon which the sheet is entered by suitable apparatus for lifting its advancing edge as the gripers release it. A series of pulleys, P P, upon the shaft *b* parallel with the cylinder A, run partly within or between the bridges B B. Pulleys P′ P^2, similar to P P, run upon two other shafts, *c* and *d*, also parallel to the cylinder A. The three shafts carrying the series of pulleys P P′ P^2 are connected by suitable frame-pieces *f f f′ f′* in such manner that tapes, belts, or cords will run jointly upon pulleys P and P′, and similar tapes, belts, or cords also upon the pulleys P′ and P^2, the whole being so constructed as to operate upon the shafts *b* and *c* as hinges, permitting the frame with its shafts, pulleys, and tapes to assume the folded or doubled-up position shown in the dotted lines in Fig. 1. A pair of levers, L L, are pivoted to the frame of the machine by means of a shaft, O, which extends across the machine. One of said levers may carry a roller, O′, at the end of a shorter arm, or a separate short arm attached to the shaft O may carry said roller O′, as is shown in the drawings, which roller engages a cam, C′. The ends of the levers L L are

connected to the shaft *d* and the cam C′ is given the proper form to move the shaft *d* in the arc described by it at a uniform velocity corresponding to the velocity of the sheet as it issues from the cylinder A. By suitable mechanism the cam C′ is driven at a rate having a suitable ratio with the movements of the other parts of the machine. A spring, S, is connected with a shorter arm of one of the levers L, which spring, by its resistance to compression, will keep the roller O′ in contact with the cam C′, by which means said cam imparts the return motion to the delivery-frame.

It is evident, however, that a spring may be connected to either or both of the levers L above their respective pivotal points, which spring or springs, by resistance to elongation, will maintain the desired contact of the roller O′ with the cam C′. The fly-board F, upon which the sheets are to be deposited, is provided with a series of adjustable stops, F′, against which the advancing edges of the sheets are delivered to insure an even-edged pile upon the fly-boards.

The operation of the invention is as follows: As the sheet enters upon the bridges B B the tape-frame with its shafts and pulleys is in the position shown in full lines in Fig. 1, in which position it has nearly completed its downward movement, and where it remains until the sheet has been carried by the tapes T T T′ T′, upon which it rests to a point so far beyond the shaft *d* that the advancing edge of the sheet touches the stops F′. The cam C′ is so placed as to commence at this time to impart motion to the shaft *d*, which motion folds or doubles up the delivery-frame, and continues until said frame has assumed the partially-closed position shown in dotted lines in Fig. 1, at which point it will have passed from under the sheet, leaving it upon the pile, and thus deposited upon the feed-board. From this point, by the further rotation of the cam C′ and the reaction of the spring S, the frame assumes its original position, as shown in full lines in Fig. 1, ready for the reception of a succeeding sheet. Rotary motion is given to the shafts *b*, *c*, and *d*, such as to cause the velocity of their tapes or cords to be uniform with the velocity of the surface of the cylinder A by any suitable connection with other rotating parts of the machine.

It is not essential to this invention that the folding or doubling up motion given to this double-hinged frame should be imparted in the manner above described, as said frame may be folded or doubled up by suitable mechanism connected to shaft *c* instead of shaft *d*, for it may, in some cases, be necessary to bring the two parts of the double-hinged frame into one straight and horizontal line when receiving the sheet, in which case the folding motion may be accomplished by elevating and depressing the shaft *c*, allowing the shaft *d* to rest and slide or roll upon any suitable horizontal support.

In some cases, as in delivering stiff cardboard, the sheets may not readily deflect to the plane of the tapes when passing over the angle made by the frame at the shaft *c* when in the position shown in full lines in Fig. 1, in which case it would be advisable to have the two halves of the double-jointed frame assume a right line. Motion should then be given to fold the frame in the manner above suggested.

I am aware that vibrating tape-frames with one end describing an arc about a fixed center at the other end have been used to deposit sheets upon a fly-board as well as to conduct them alternately to separate parts of a delivery apparatus. I do not, therefore, claim any such single vibrating frame or frames, all of which, moreover, have had tapes or cords, as described, on both sides of the delivered or passing sheets, thus carrying the sheets between tapes instead of upon tapes; but

As of my invention I claim—

In combination with a printing-press or other machine for the delivery of separate sheets of paper in a pile, a vibrating double-hinged tape-frame, the one part vibrating about a fixed center, and the other part vibrating about the movable end of the first part as a center, having at the two centers of vibration and at the free end of the double frame rotary shafts carrying suitable tapes, cords, or belts, whereby sheets of paper are delivered from said frame, substantially as and for the purpose set forth.

JOHN T. HAWKINS.

Witnesses:
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