(No Model.) 3 Sheets—Sheet 1.

E. NISTER.

SHEET DELIVERY MECHANISM FOR PRINTING MACHINES.

No. 602,238. Patented Apr. 12, 1898.

Fig. 1.

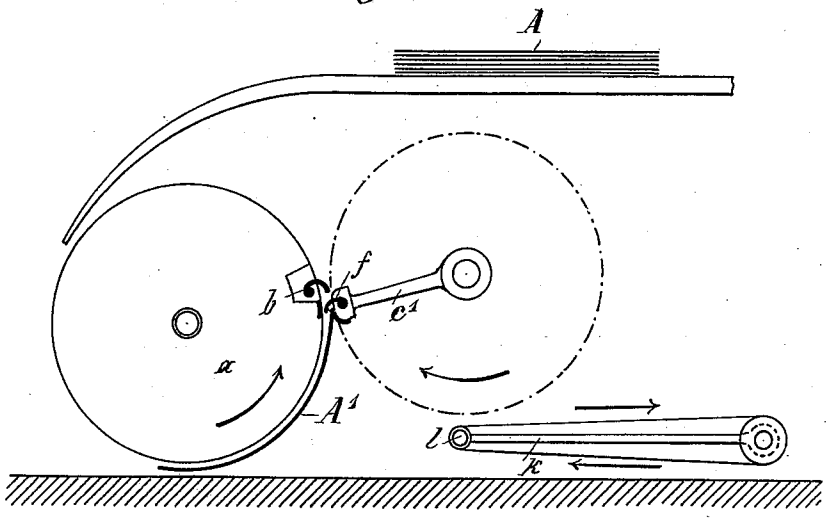
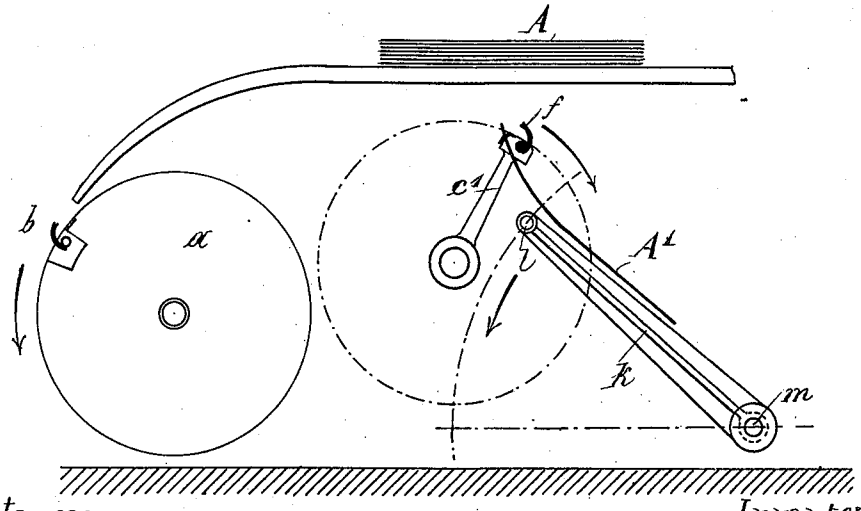


Fig. 2.



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(No Model.) 3 Sheets—Sheet 2.

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SHEET DELIVERY MECHANISM FOR PRINTING MACHINES.

No. 602,238. Patented Apr. 12, 1898.

Fig. 3.

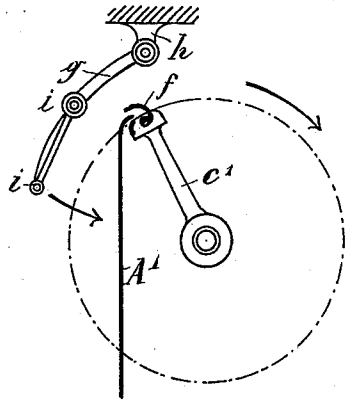


Fig. 4.

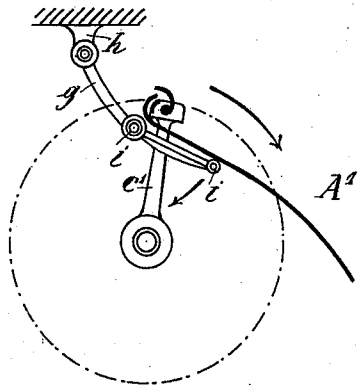
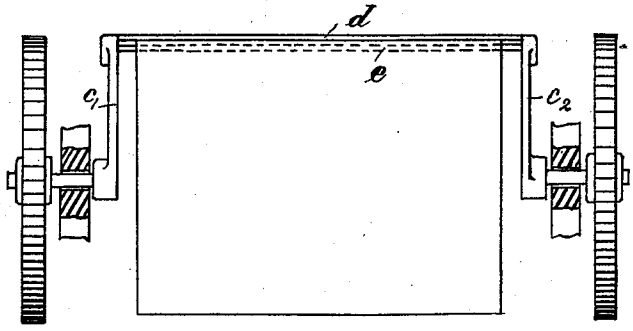


Fig. 5.



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(No Model.) 3 Sheets—Sheet 3.

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SHEET DELIVERY MECHANISM FOR PRINTING MACHINES.

No. 602,238. Patented Apr. 12, 1898.

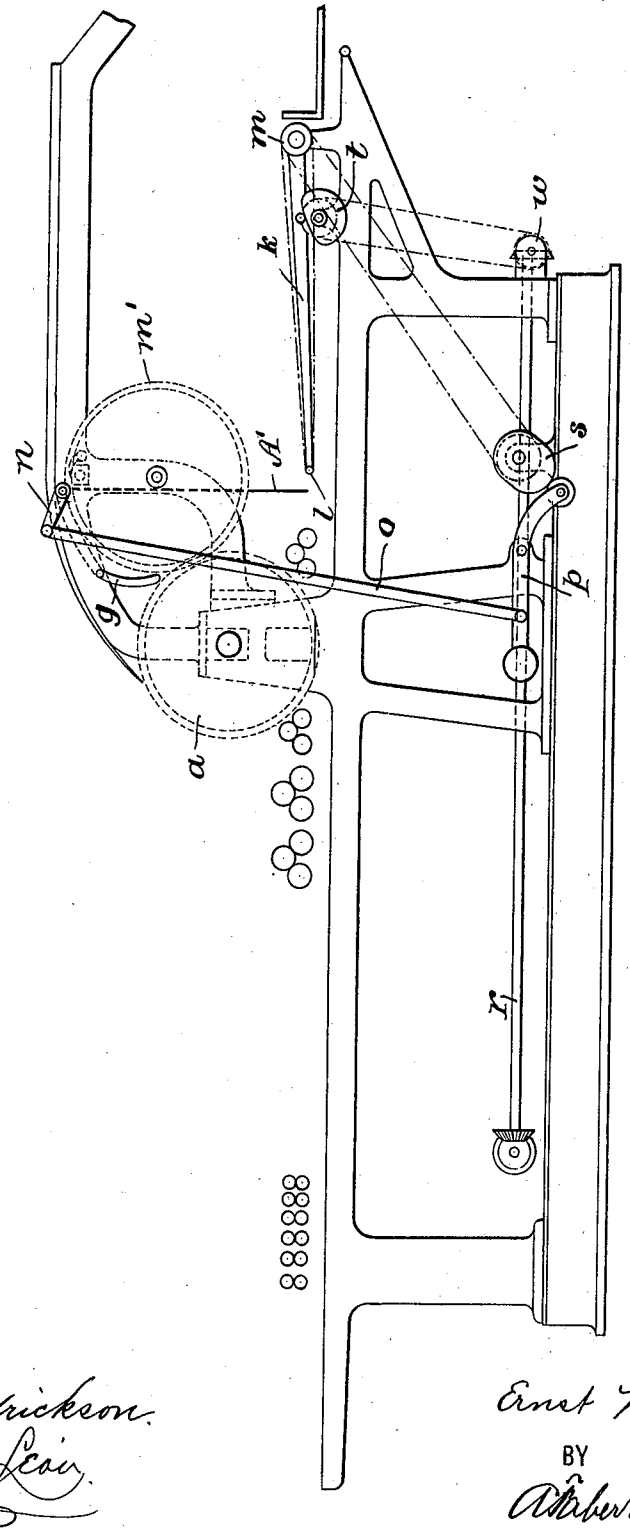


Fig. 6.

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UNITED STATES PATENT OFFICE.

ERNST NISTER, OF NUREMBERG, GERMANY.

SHEET-DELIVERY MECHANISM FOR PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 602,238, dated April 12, 1898.

Application filed November 16, 1896. Serial No. 612,182. (No model.)

To all whom it may concern:

Be it known that I, ERNST NISTER, a subject of the King of Bavaria, residing at Nuremberg, in the Kingdom of Bavaria, Germany, have invented new and useful Improvements in Sheet-Delivery Apparatus, of which the following is a specification.

My invention has reference to sheet-delivery apparatus for printing-presses having rotary impression-cylinders—such, for instance, as lithographic presses—and has for its object to deliver the sheet without its printed side coming into contact with the delivery apparatus when the said sheet-delivery apparatus is located at the rear of the cylinder.

To this end my invention consists, essentially, in a sheet-delivery apparatus composed of a revolving fly located at the rear of the impression-cylinder and provided with grippers adapted to take the printed sheet from the impression-cylinder and to hold the same in suspension and a rocking frame adapted to move upwardly to engage with the free end of the sheet from beneath while said sheet is suspended from the fly and to receive said sheet with the unprinted side down. In combination with the elements just recited I make use of a displacer adapted to engage with the printed sheet while suspended from the fly for deflecting the same, such displacer being particularly valuable in large printing-presses.

The nature of my invention will best be understood when described in connection with the accompanying drawings, in which—

Figures 1 and 2 are side elevations illustrating the operation of the gripper-fly and the rocking frame. Figs. 3 and 4 are similar views illustrating the operation of the sheet-displacer. Fig. 5 is an end view of the same. Fig. 6 is a side elevation of a stop-cylinder or lithographic press embodying my invention, part being broken away.

Similar letters of reference designate corresponding parts throughout the several views of the drawings.

Referring at present to Figs. 1 and 2 of the drawings, the letter *a* designates the impression-cylinder, provided with grippers *b*, serving to take the sheet fed from the pile of sheets A on the usual feed-board. At the rear of the impression-cylinder *a* and mounted to turn about an axis parallel to the axis of rotation of the same is located a rotary fly adapted to take the sheets from the impression-cylinder. This fly is composed of two arms c' c^2, carrying at their ends connecting-rods *d* and *e*, Fig. 5, provided with usual grippers *f*. The fly is geared to revolve with the same peripheral velocity as that of the impression-cylinder, but in an opposite direction, as indicated by the arrows in Figs. 1 and 2. The displacer, Figs. 3 and 4, is swung from brackets *h*, attached to the frame of the machine above the fly and is composed of bent lever-arms *g*, suspended from said brackets and connected with each other by rods *i*. The rocking frame *k* is mounted to turn about a horizontal shaft located at the rear of the fly and is provided with delivery-tapes passing over suitable rolls *l* and *m* at opposite ends thereof. The rolls *l* and *m* rotate in the same direction as the fly-frame. The inner end of the rocking frame is adapted to cross the path of the grippers *f* of the fly.

The operation of the sheet-delivery apparatus is as follows: The sheet A′ is fed from the feed-board to the grippers *b* of the impression-cylinder *a* and carried over the type or stone. During the time of printing the sheet the displacer *g i* is at rest and the rocking frame *k* is in a horizontal position. After about half a revolution has been made the impression-cylinder is in the position shown in Fig. 1. The grippers *b* of the same then open and the printed sheet A′ is delivered to the grippers *f* of the fly. When the sheet has completely left the impression-cylinder, owing to the upward movement of the fly, the sheet vibrates laterally, Fig. 3, such movement being partly produced by the weight of the freely-suspended sheet and partly by the movement of the fly, which continues to revolve with a uniform speed. The forward movement of the displacer *g i* now takes place and turns the sheet into the position shown in Fig. 4, and the grippers *f* are then opened and the sheet is received with its printed side up by the tapes or equivalent surface of the rocking frame *k*, which in the meantime has been turned upwardly to its extreme position, as shown in Fig. 2. The sheet is delivered

by the tapes to the delivery-table. The displacer and the rocking frame then assume their original positions, Figs. 1 and 3.

In Fig. 6 I have shown the sheet-delivery apparatus embodied in a stop-cylinder or lithographic press and illustrated means for operating the several parts.

The fly carrying the grippers *f* is operated from opposite sides by gear-wheels *m'*, meshing into the gears of the impression-cylinder *a*. The displacer *g i* is vibrated by means of an arm *n*, attached to its shaft and connected with a crank-arm *p* by a rod *o*, said crank-arm being vibrated by a cam *s*, properly timed. The delivery-frame *k* is rocked by means of a cam *t*, engaging with a roller-stud mounted on one of its sides. The shafts of the cams are rotated from a pulley or chain wheel *w*, which is geared to a supplemental shaft *r*, geared to the main shaft of the machine.

In smaller printing-presses the displacer *g i* may be omitted, because in such presses the pendulous motion of the sheet is in itself sufficient to produce the lateral deflection necessary to bring the sheet over the rocking frame *k* when the same is moved upwardly.

The sheet-delivery apparatus may of course be applied to any printing-press having an impression-cylinder mounted to rotate.

What I claim as new is—

1. In a sheet-delivery apparatus for printing-presses, the combination of a revolving fly located at the rear of the impression-cylinder and provided with grippers adapted to take the printed sheet from the impression-cylinder and to hold the same in suspension under vibration, and means adapted to engage with the free end of the sheet from below while said sheet is suspended from the fly so as to receive said sheet with the unprinted side down, substantially as described.

2. In a sheet-delivery apparatus for printing-presses, the combination of a revolving fly provided with grippers adapted to take the printed sheet from the impression-cylinder, a displacer adapted to engage with the printed sheet while suspended from the fly, and a frame provided with delivery-tapes for receiving the printed sheet, substantially as described.

3. In a sheet-delivery apparatus for printing-presses, the combination of a revolving fly provided with grippers adapted to take the printed sheet from the impression-cylinder, a vibratory displacer adapted to engage with the printed sheet while suspended from the fly to deflect the sheet, and a rocking frame adapted to move upwardly to receive the sheet when deflected, and provided with delivery-tapes, substantially as described.

4. In a sheet-delivery apparatus for printing-presses, the combination of a revolving fly provided with grippers adapted to take the printed sheet from the impression-cylinder by its leading end and to hold the same in suspension, and a rocking frame adapted to move upwardly to receive the following end of the sheet while suspended from the fly, and provided with delivery-tapes, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ERNST NISTER.

Witnesses:
CARL ROCSCHELY,
OSCAR BOCK.