

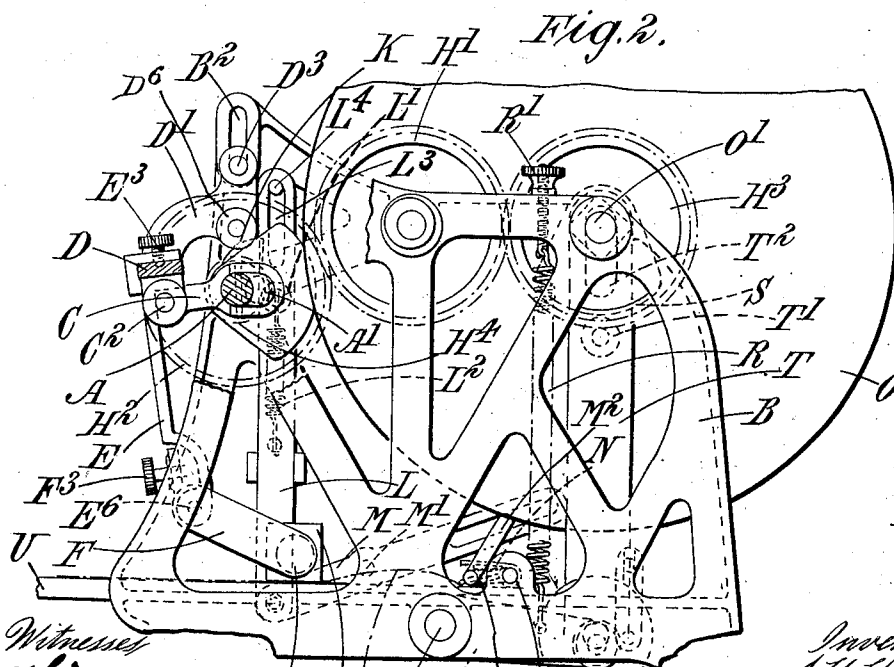
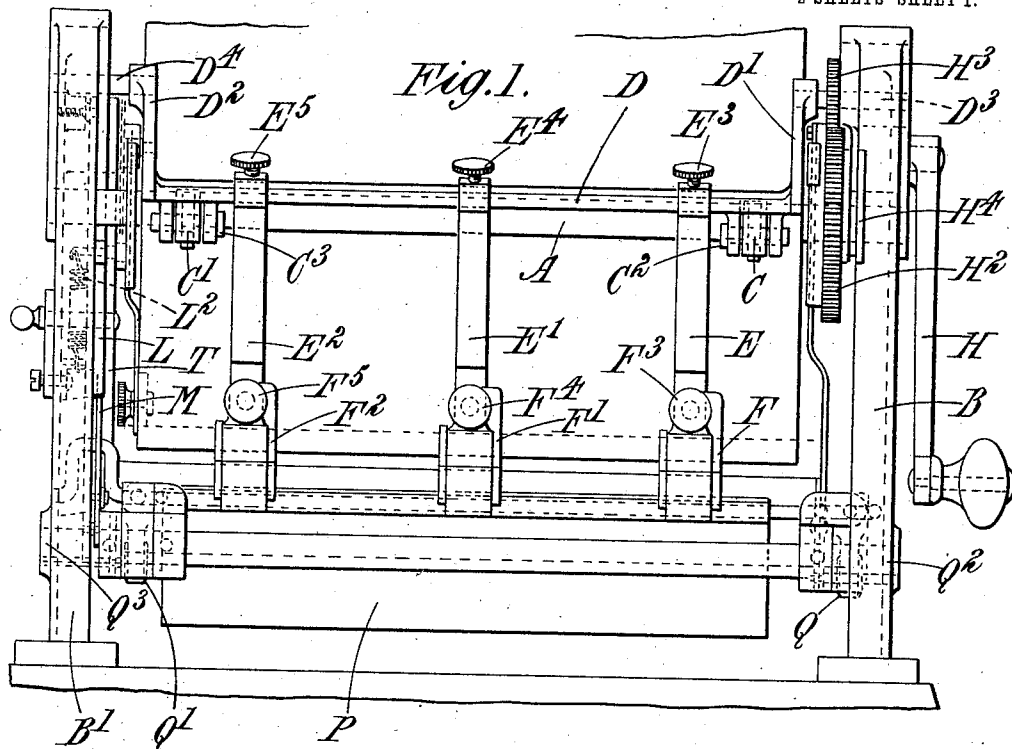
J. H. HASTINGS.
PAPER SHEET SELF FEEDING DEVICE FOR PRINTING MACHINES.

APPLICATION FILED JUNE 23, 1911.

Patented Jan. 14, 1913.

1,050,650.

2 SHEETS-SHEET 1.



Witnesses

Byron B. Collings.

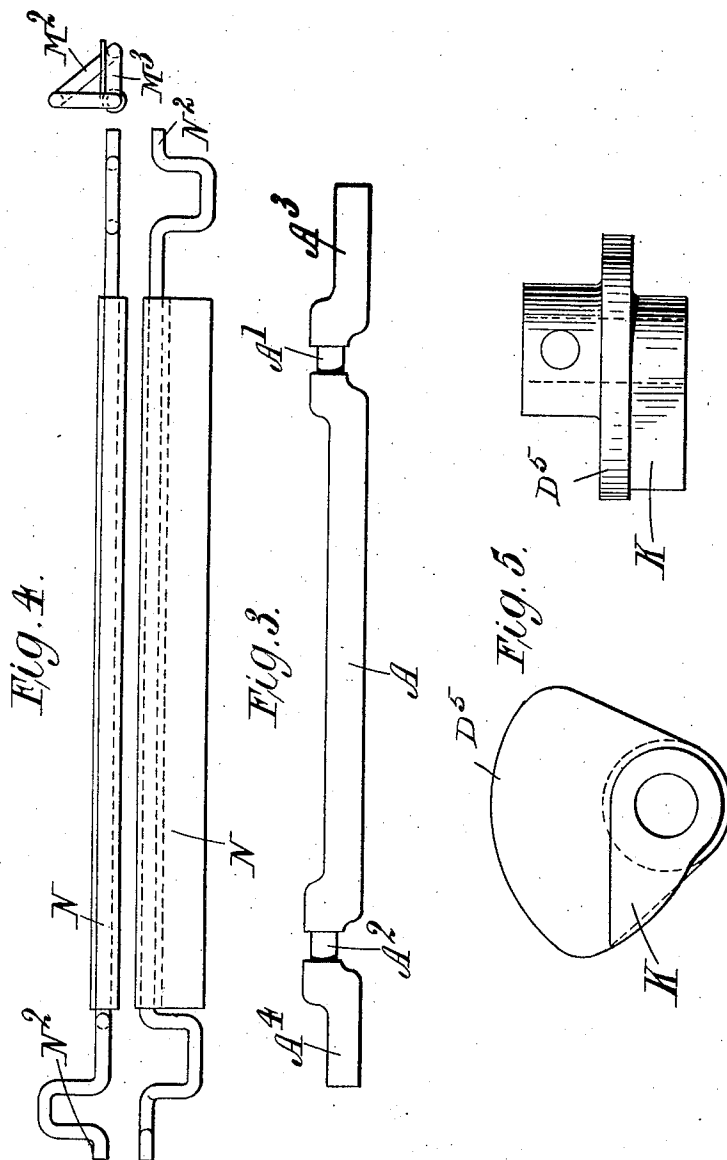
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UNITED STATES PATENT OFFICE.

JAMES HAROLD HASTINGS, OF YOKOHAMA, JAPAN.

PAPER-SHEET SELF-FEEDING DEVICE FOR PRINTING-MACHINES.

1,050,650.

Specification of Letters Patent.

Patented Jan. 14, 1913.

Application filed June 23, 1911. Serial No. 634,918.

To all whom it may concern:

Be it known that I, JAMES HAROLD HASTINGS, a subject of the King of England, residing at Yokohama, Japan, have invented certain new and useful Improvements in Paper-Sheet Self-Feeding Devices for Printing-Machines, of which the following is a specification.

This invention particularly relates to improvements in paper-sheet self-feeding devices for printing machines or duplicators and the like and especially refers to the type of machine known as the "Crown" duplicator. The principles of the invention are nevertheless applicable to other devices in which there is necessity for the periodical feeding forward of paper sheets for further treatment.

The object of the invention is to bring about a rapid, accurate, self-feeding of the paper to machines of the type described.

In duplicators of the kind hitherto constructed are provided a platen or drum supported on side frames and a roller cooperating with the drum to perform the printing, one of the supports of the roller being always pulled up by a helical spring and pushed down by cams attached to the drum shaft, whereby the drum is pressed upon by the roller only when the paper is to be printed. The roller is disengaged from the drum by the cams when the printing is finished.

It will be seen that if a paper sheet is held by its edges and the edges then pressed toward one another, the paper will bend and take up an "arched" position. If now one of the edges be released, the paper will at once tend to rapidly straighten out under the natural spring inherent in itself.

According to this invention a self-feeding device for paper sheets utilizes the natural spring of the paper when released from the "arched" position taken up during its compression by forces acting in the direction of feeding the sheets. In order to bring about this arching of the paper the frictional contact between the surface thereof and the surface of a reciprocating body resting upon the sheet causes the one edge of the sheet to move forward over a relatively fixed surface while the other edge abuts against a stop or keeper. This stop or keeper is periodically lifted, when the paper

thus released from its constrained position shoots forward into place on the drum or platen of the machine.

In the accompanying drawings:—Figure 1 is a front elevation of a duplicator constructed according to this invention. Fig. 2 is a side elevation of the machine viewed from the right, parts being broken away for clearness sake, Figs. 3 to 5 represent details.

The self-feeding device consists of a crank shaft A journaled at A³ and A⁴ in the end frame B and B¹, and provided with cranks A¹ and A² extending rotatably through links C and C¹ pivoted to a transverse beam D at C² and C³; said beam D being provided with arms D¹, D² from which project pins D³, D⁴ engaging in the vertical slots B², of the end-frames B, B¹. A cam D⁵ is secured to the crank shaft A in position to engage a roller D⁶ on the arm D¹ of the transverse beam D for elevating said beam D upon rotation of the crank shaft.

Depending from the transverse beam D are arms E, E¹, E² clamped to D at E³, E⁴, E⁵ and supporting on pivots E⁶, links F, F¹, F² provided with adjusting screws F³, F⁴, F⁵ and bearing the friction blocks G, arranged to turn freely on the pins G³. The crank-shaft A is rotated by suitable gearing such as H¹, H², turned by a handle H through a disengaging clutch H⁴. At one end of the crank-shaft A is fixed a cam K which engages with a roller L¹ thus acting upon the rod L (provided with a guiding slot L³ and pin L⁴) in an upward direction against the action of the spring L², and in turn upon the lever M pivoted at M¹.

The lever M is provided with a slot for connecting the lever to a crank rod M² to which is fixed a paper stop or keeper N. The crank rod M² has journals N² which are rotatably mounted in bearings N¹ in the side frames B, B¹.

Beneath the drum or platen O of the machine is a roller P of india-rubber or other suitable material swinging on arms Q, Q¹ journaled at Q², Q³ and normally drawn upward by the spring R the tension of which is adjustable at R¹. The cam S fixed upon the drum shaft O¹ (driven through the gearing H³) presses, against the action of the spring R, upon the roller T¹ on the rod T controlled in its motion by the slot T² through which the shaft O¹ passes and con-

nected to one of the swinging arms Q^1 at its other end. The sheets of paper arranged in a pile rest upon the base or slab U.

The operation of the device is as follows:—When self-feeding of the paper is desired, the crank-shaft A is engaged with the gear-wheel H^2 (fitted loosely on the crank-shaft A) by means of the clutch H^1 . The handle H is turned and the shaft A follows the consequent motion of the wheel H^2 ; then by the movement of the arms C, C^1 , on the crank-shaft, the transverse beam D is moved in a direction toward or from the drum O. The beam D is not supported on fixed points at both ends, but, guided in the vertical slots B^2 , is in a raised position during the forward motion and in a lowered position during the return motion of the beam; hence the reciprocating blocks G held by the hanging arms E, E^1 , E^2 on the beam proceed to rub on the base U during the forward movement and are free from the base during the return motion, so that it will be seen that paper sheets placed on the base will be fed forward sheet by sheet. When the blocks reach near the end of the forward motion, the cam K pushes up the rod L, the pin L^4 on which is guided by the slots L^3 in the side frame similarly to the transverse beam, and the lower end of which is attached to the pivoted lever M. The other end of the lever M is connected to the crank rod M^2 carrying the paper keeper or stop N and the sheets to be printed are pushed up to this stop, while the uppermost of them is bent or arched by the rubbing motion of the reciprocating blocks G, as shown at W in Fig. 2. A little before the blocks leave the paper, the member N suddenly swung upward by the agency of the cam K acting through the rod L, lever M and connections M^2 , M^3 , ceases to restrain the edge of the paper, whereby the sheet rushes forward and is caught between the drum O and the roller P. The roller P below the drum is supported by two arms Q, Q^1 , which are pivoted on the side frames at Q^2 , Q^3 and pulled up by the vertical helical spring R. One of the arms is connected to the vertical rod T which by the cam S on the drum shaft O^1 acting on the roller T^1 is pressed down intermittently, bringing the roller P to bear against or causing it to move away from the drum.

When self-feeding action is not required, the connection between the wheel H^2 and the drum O is disengaged by the clutch H^1 and the transverse beam N is raised, so that the machine may be operated in the usual manner.

Suitable adjustments are provided at various parts of the machine. For instance, the arms E, E^1 , E^2 , by slacking off the clamps E^3 , E^4 , E^5 may be moved along the transverse beam D so that the distribution of the rubbing action of the blocks G may be varied with varying sizes of paper used in the machine. Another adjustment is indicated for the links F, F^1 , F^2 whereby by screwing in or out the screws F^3 , F^4 , F^5 the blocks G may be raised or lowered in relation to the arms E, E^1 , E^2 . The tension of the spring R and hence the pressure of the roller P upon the drum O is also conveniently varied by turning the adjusting screw R^1 .

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

1. In a self-feeding device for printing machines, the combination of a frame provided with slots, a crank shaft rotatably supported in the frame, a beam, arms extending from the beam and carrying pins engaging said slots, connecting rods for actuating the beam from the crank shaft, a support for a sheet pile, a stop operated from the crank shaft for alternately holding and releasing one edge of the sheet pile, and means actuated by said beam for forcing the sheets against the stop, substantially as described.

2. In a self-feeding device for printing machines, the combination of a frame provided with slots, a crank shaft rotatably supported in the frame, a beam, arms extending from the beam and carrying pins engaging said slots, connecting rods for actuating the beam from the crank shaft, a support for a sheet pile, a crank rod journaled in the frame and carrying a stop for alternately engaging and releasing one edge of the sheet pile, means actuated by said beam for forcing the top sheet of the pile against the stop, levers pivoted to the frame and slotted at one end for receiving the cranks of the crank rod, slotted rods guided by pins fixed to the frame and pivotally connected to the free ends of the levers, springs for holding the rods in their normal positions, rollers carried by the rods, and cams fixed to the crank shaft for engaging said rollers to actuate the rods and release said edge of the sheet pile, substantially as described.

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

JAMES HAROLD HASTINGS.

Witnesses:

C. B. BERNARD,
L. C. SHARMAN.