

F. J. EBERLE.
SHEET FEEDING MECHANISM FOR PRINTING PRESSES.
APPLICATION FILED FEB. 25, 1911.

1,018,815.

Patented Feb. 27, 1912.

2 SHEETS—SHEET 1.

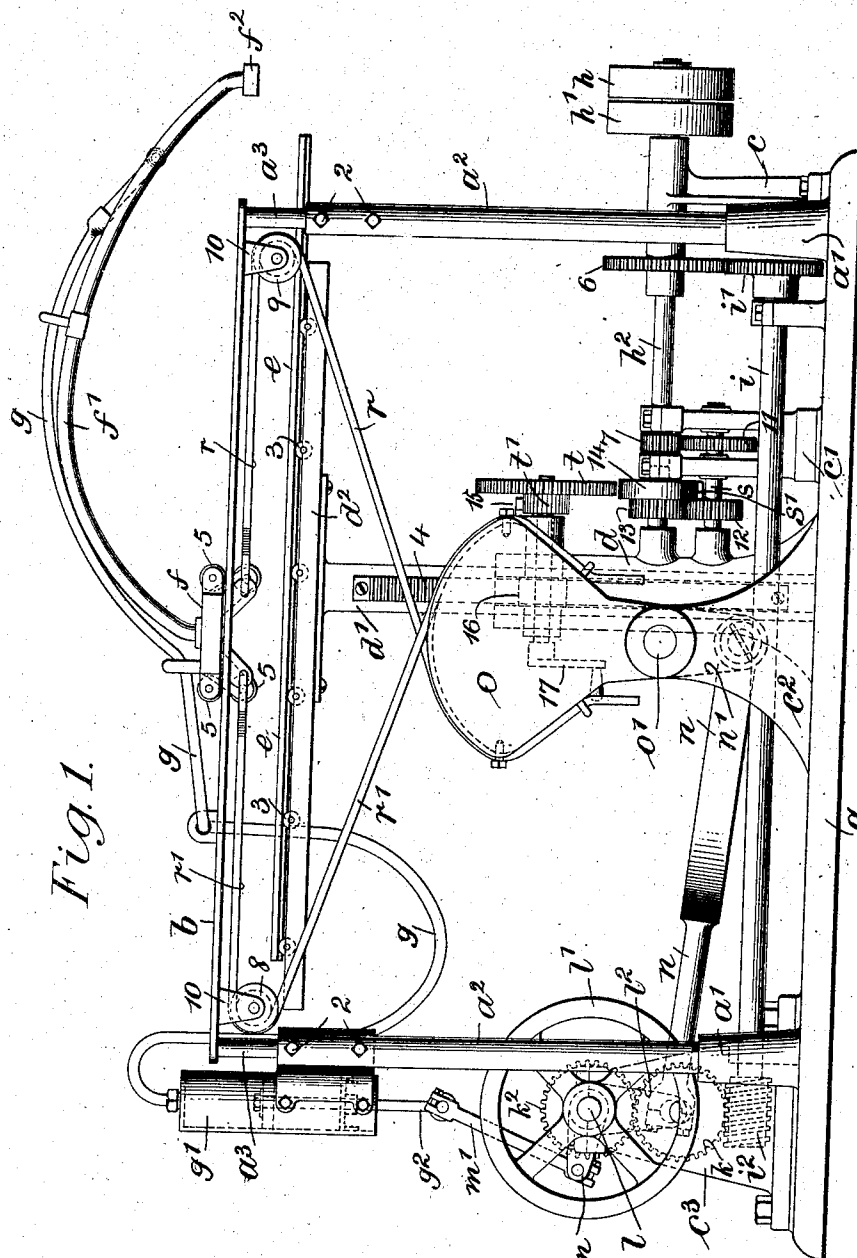


Fig. 1.

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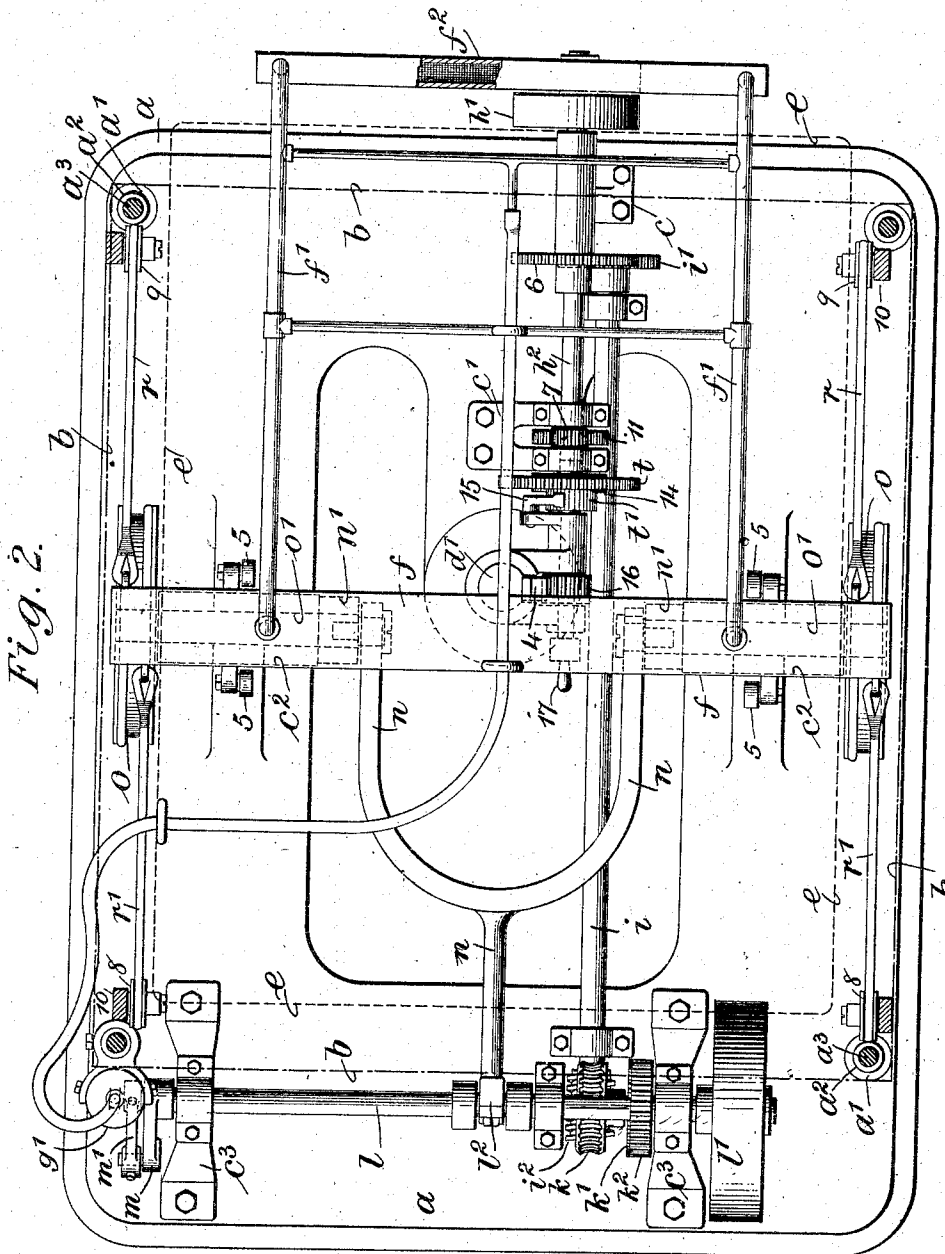


Fig. 2.

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UNITED STATES PATENT OFFICE.

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SHEET-FEEDING MECHANISM FOR PRINTING-PRESSES.

1,018,815.

Specification of Letters Patent.

Patented Feb. 27, 1912.

Application filed February 25, 1911. Serial No. 610,786.

To all whom it may concern:

Be it known that I, FRANK J. EBERLE, a subject of the Emperor of Austria-Hungary, residing in the borough of Brooklyn, in the county of Kings, city and State of New York, have invented an Improvement in Sheet-Feeding Mechanism for Printing-Presses, of which the following is a specification.

The machine of my invention is designed as an auxiliary to a printing press. The machine may be actuated by said press or by any suitable source of power and is adapted to place thin sheets of paper between sheets as printed and delivered from the printing machine so as to receive any off-set, and the same is adapted for use especially in connection with lithographic and color printing. These sheets receive any off-set and prevent an off-set upon the backs of the printed sheets which in the present method of printing sheets is quite frequent. These sheets may be used over and over again if thoroughly dried in the intervals.

In carrying out my invention, I employ a movable table to hold the pile of filling-in sheets of paper, means for gradually raising the same as the sheets are removed and for lowering the table to an initial place; a sucker arm and support on a reciprocating carriage; pivoted swinging arms and oppositely extending flexible members such as straps therefrom to said carriage for its reciprocating movement; a pump for creating a suction in the sucker arm and means for actuating the same; also suitable devices for actuating the swinging arms and the pump device and for automatically and gradually raising the table and pile of filling-in sheets, all of which is hereinafter more particularly set forth.

In the drawings, Figure 1 is a side elevation and Fig. 2 a sectional plan representing the device of my improvement.

The bed or foundation of the machine is represented at *a* and rising therefrom are corner standards *a*¹ and fitting said corner standards are tubular corner columns *a*², and within these columns are posts *a*³ which are connected to the four corners of the table or platform *b*, and I provide nuts 2 in the corner columns *a*² adapted to bear against the posts *a*³ and hold the same, with

the table or platform *b*, in an adjustable position.

Secured to the bed *a* or formed in one therewith are bearing standards *c* *c*¹ *c*² and *c*³; the standards *c*² and *c*³ being in pairs; and I also provide a center standard *d* secured to or formed with the bed *a* and which is vertically grooved and hollow. This center standard *d* receives the vertical columns *d*¹ the upper end of which is secured to the platform *d*². This platform is of appreciably less width than the table or platform *b* and it is provided with rollers 3 at spaced intervals along the opposite edges and adapted to receive a table *e*, the same resting upon said rollers 3 and adapted to move in the line of longest dimensions of the bed *a* and between the posts *a*³ of the respective sides.

The column *d*¹ is provided with a rack 4 vertically placed and adapted to move in a vertical groove formed in the center standard *d* whereby the column *d*¹, its platform *d*² and the table *e* may be raised and lowered; the means for doing this being herein-after described.

The table *e* is a support for the pile of superposed filling-in sheets and it is placed on rollers so that it may be adjusted in position and so that it may be pulled to the left hand of Fig. 1 to any desired position for the more ready placing thereon of the pile of filling-in sheets.

I provide a carriage *f* upon rollers 5 in pairs at opposite sides and coming both above and below the table or platform *b*, part of which at least forms a guide for the carriage and by preference, as shown in Fig. 2, this carriage extends across the table or platform *b* and moves in lines with the arms *f*¹ that are secured thereto and bend over forward to the right hand of Figs. 1 and 2. These arms may be of any desired character and are shown for convenience as made of piping, and on the free ends of said arms I secure a sucker arm *f*² which is parallel with the carriage *f*. A hose *g* of flexible material is secured at one end to the arms *f*¹ adjacent to the sucker arm and said hose extends to the left hand of the figures of the drawing to connection with a pump *g*¹ having a piston rod *g*² and which pump with the motions of the machine is adapted to create a suction so as

to attach by pneumatic pressure to the under surface of the sucker, a sheet at a time for the movement of the same, that is, for removing a sheet at a time from the pile of sheets supported by the table *e*.

h *h*¹ represent fast and loose pulleys on the shaft *h*², which shaft is provided with suitable bearings at the upper ends of the bearing standards *c* *c*¹. On this shaft *h*² I provide gears 6 7; the gear 6 being a large one and the gear 7 in the nature of a pinion. I also provide a shaft *i* in suitable bearings on the bed *a* off-set in a vertical plane which is parallel to a vertical plane through the shaft *h*². On this shaft *i* is a gear *i*¹ meshing with the gear 6 and on the opposite end of the shaft *i* at the left hand of Fig. 1, is a worm *i*². This worm *i*² engages with a worm wheel *k* on the short shaft in the bearing standard *c*³ and on this short shaft there is also a gear *k*¹. The gear *k*¹ meshes with the gear *k*² near one end of the crank shaft *l*. This crank shaft *l* is in bearings at the upper end of the bearing standard *c*³ and on one end thereof I prefer to place a fly-wheel *l*¹. This crank shaft is provided with a crank *l*² and with a crank arm *m* from the free end of which extends a connecting rod *m*¹ to move the piston rod *g*² of the pump, so that by the rotation of the crank shaft *l* through the medium of the shaft *i*, worm *i*², worm-wheel *k*, gears *k*¹ and *k*², the said crank shaft *l* is rotated.

The action of the pump is in evidence through the hose *g* of the sucker arm *f*². The connecting rod *m*¹ is preferably made adjustable lengthwise to accommodate the stroke to sheets of varying sizes.

I provide a forked rod *n* at one end connected to the crank *l*² and at the free ends of the forked portions pivotally connected to the crank arms *n*¹. These crank arms are mounted upon shafts *o*¹ in the bearing standards *c*² and on the other ends of the shafts *o*¹ are rocker arms *o*, the top portions of which are formed as segments.

I provide flexible strap members *r* *r*¹ connected at one end by any suitable means and in any suitable manner, for slack or stretch to the sides of the rocker arms *o* overlying the upper face of the segmental portion of the same and crossing and passing around the pulleys 8 9 of the bracket bearings 10 secured to the under side of the table or platform *b* adjacent to the corner posts *a*³ and the other free ends of said flexible strap members are secured by eyes or in any other suitable manner to the under portion of the carriage *f*, from which it will appear that as the rocker arms *o* swing on their shafts *o*¹ in the bearing standards *c*², they first pull on the strap members *r* and then on the strap members *r*¹ to move the carriage *f* in a reciprocating manner forward and backward on the upper surface of

the table *b* and in doing so they impart a similar motion to the sucker arm *f*².

I provide a short shaft *s* in bearings of the bearing standard *c*¹ and a hub on the standard *d* and on this short shaft *s* there are gears 11 and 12; the gear 11 by preference being the larger and meshing with the gear or pinion 7. Another short shaft is provided with similar bearings and the same carries a gear 13 and a wheel 14 provided with a single tooth *s*¹. The center standard *d* is also provided with bearings for a short shaft and upon this shaft is a gear wheel *t* and ratchet wheel *t*¹ and a pinion 16 between the projecting member of the center standard *d* which form bearings for said shaft and on the opposite end of this shaft to the gear *t* is a handle 17, or equivalent wheel, and I provide,—supported upon a suitable arm,—a pawl 15 which is adapted to engage the teeth of the ratchet *t*¹ and in so doing supports the column *d*¹, platform *d*² and table *e* as well as prevents the backward rotation of the gear *t*, ratchet *t*¹, handle 17 and the shaft on which they are mounted.

In the operation of the device of my invention, the shaft *h*² is turned by a belt and the source of power may be the printing press which by preference is located adjacent to the machine of my invention, or some other suitable source of power; the belt therefrom passing over one of the pulleys *h*¹ and when on the fast pulley rotating the shaft *h*² and its gear 6 and therefrom communicating steady power and rotation through the gear 6, gear *i*¹, shaft *i*, worm *i*², worm wheel *k*, gear *k*¹ and short shaft to the gear *k*² and the shaft *l* and then from the shaft *l* to the forked rod *n*, crank arms *n*¹, shaft *o*¹, rocker arms *o* and flexible strap members, as hereinbefore described, to the carriage *f* and the sucker arm carried thereby. At the same time the shaft *l* actuates the pump mechanism as hereinbefore described. Simultaneous with this movement the shaft *h*² also rotates the gear, the pinion 7, the gear 11 on the shaft *s*, the gears 12 and 13 and the shaft of the gear 13 and also the toothed wheel 14 and brings its tooth *s*¹ once in every revolution into mesh with the teeth of the gear *t* so as to turn the gear *t* and the ratchet *t*¹ and gradually a tooth at a time in the rotation of the wheel 14 raises the rack 4, standard *d*, platform *d*² and the table *e*.

Between the engaging periods of the tooth *s*¹ the gear *t* and the parts actuated thereby to raise the platform and table are held by the pawl 15 so that the table is not only supported but it can be gradually raised as the sheets one at a time from the pile thereon are removed. They are removed as hereinbefore described by the action of the sucker arm *f*² which with its carriage *f* is moved forward and backward by

the flexible strap members r r^1 and the rocker arms and the segments o . This sucker arm f^2 , as will appear from Fig. 2, is almost as long as the sheets which it may be desirable to place upon the platform b and the suction action is so pronounced by virtue of the pump, that even should the sucker arm be a minute amount above the upper sheet the sheet will be raised to its surface and will be held so by the vacuum action with sufficient force to pull the sheets one at a time off the pile on the table e and carry them forward. The suction action is produced on the down stroke of the piston and piston-rod g^2 , and on the upstroke the air is forced out and the sheet forced away from the face of the sucker arm. The movement of the sheets conveys them from the superposed pile upon the table e to the table of the printing press placed adjacent and on which are laid the printed sheets, so that the action of the printing press in delivering printed sheets upon the table and the action of the sucker arm f^2 are caused to alternate so that after a sheet is laid on the table of the printing press, a sheet from the table e is laid thereon and the sucker arms recede, and with the alternating movement printed sheets and filling-in sheets are deposited into a common superposed pile and any off-set of the printed sheets is taken on the filling-in sheets which may after drying be removed by hand.

I have frequently noticed in the case of postal cards that are printed in groups or series upon the same sheet and afterward cut up, that the thin tissue paper or filling-in sheets remain over the printed surface of the postal card when the same are offered for sale in the stores. Heretofore, as I understand, these filling-in sheets have been laid by hand, requiring active work on the part of trained assistants, but with the device of my invention these sheets may be placed in position upon the printed sheets as laid on the table after printing and filled in without the presence of an attendant and entirely automatic in connection with and for use with the delivery of printed sheets.

It will be noticed from the foregoing description that the table e is raised progressively as the sheets are removed and that with the removal of the last sheet it is advantageous to similarly arrest the motion of the printing press and of the machine of my improvement and to draw the table e to the left hand of Fig. 1 and place thereon another pile of superposed filling-in sheets, and while the sucker arm is in a position corresponding to that shown at the right hand of Fig. 1, the table may be moved back into the full line position shown in Fig. 1, and the handle 17 grasped by an attendant for the support of the column

d^1 , platform d^2 and table e . The pawl 15 is then swung over so as to release its hold upon the ratchet t^1 , and manually by the turning of the handle 17 these parts may be lowered so as to bring the uppermost sheet on the table e into the right position for engagement with the sucker arm f^2 . The pawl 15 is then swung over into engagement with the ratchet t^1 and the machines started and the operations herein described repeatedly performed.

I claim as my invention:

1. In a machine of the character described, the combination with a traveling carriage, a sucker arm mounted thereon and means for actuating said parts, of a vertically movable platform, a supporting column therefor, beneath said platform and a bearing-standard in which the column is vertically movable, rollers upon the said platform and a table for superimposed sheets supported by said platform and rollers and movable upon said rollers, a power shaft and devices operatively extending therefrom for progressively raising said column, platform and table, and other devices for manually returning the said parts to an initial position.

2. In a machine of the character described, the combination with a traveling carriage, a sucker arm mounted thereon and means for actuating said parts, of a vertically movable platform, a table mounted upon the platform and movable over the same and adapted to receive a superposed pile of sheets, a supporting column centrally beneath said platform, a bearing standard in the bed of the machine, hollow and receiving said column and slotted, a rack secured to the column and movable in the slotted part of the standard-bearing formed upon said standard, and a shaft therein, a gear and ratchet mounted upon one end of said shaft, a pawl engaging the standard, a handle on the opposite end of said shaft for manually rotating the said parts; a pinion also upon said shaft meshing with said gear, a power shaft and means operated thereby for turning the said gear with a step by step motion for progressively raising the platform supported thereby and the table and sheets thereon.

3. In a machine of the character described, the combination with a traveling carriage, a sucker arm mounted thereon and means for actuating said parts, of a platform, a table mounted upon the platform and movable over the same and adapted to receive a superposed pile of sheets, a column centrally beneath said platform, a bearing standard in the bed of the machine, hollow and receiving said column and slotted, a rack secured to the column and movable in the slotted part of the standard-bearing formed upon said standard, and a shaft

therein, a gear and ratchet mounted upon one end of said shaft, a pawl engaging the standard, a handle on the opposite end of said shaft for manually rotating the said parts, a pinion also upon said shaft meshing with said gear, a power shaft, suitable bearings therefor, a pinion thereon, a short shaft, a gear thereon meshing with the power shaft pinion, and a second gear, another short shaft and a gear thereon meshing with the latter gear and a toothed wheel also on the latter short shaft so placed that the tooth thereof is adapted to engage one tooth at a time of the first aforesaid toothed wheel.

4. In a machine of the class described, the combination with a sucker arm, a reciprocating carriage, arms extending from the carriage to and for the support of the sucker arm, a table or platform supporting said carriage and upon which the same is adapted to move, of rocker arms, shafts on which the same are mounted, bearing standards for the said shafts and the said rocker arms formed with segmental upper ends, flexible strap members secured to the sides of said rocker arms and passing over the segmental ends and crossing, pulleys for said flexible members over which they pass and the free ends of said flexible members connected to said reciprocating carriage, crank arms upon the other ends of the rocker arm, shafts, a forked rod connected to said crank arms and means for actuating the same.

5. In a machine of the class described, the combination with a sucker arm, a reciprocating carriage, arms extending from the carriage to and for the support of the sucker arm, a table or platform supporting said carriage and upon which the same is adapted to move, of rocker arms, flexible members extending from the rocker arms to the said reciprocating carriage, supports for said rocker arms, means for swinging the same, a flexible hose extending from the sucker arm, supports therefor, and a pump or vacuum producing device to which the other end of the flexible hose is secured, a shaft and means for actuating the same, a piston for said vacuum producing device and connections therefrom to said shaft, means also extending from the said shaft to connections with the rocker arms, whereby the vacuum or suction action is produced in the sucker arm and the same is moved and timed in its movement.

6. In a machine of the class described, the combination with a bed, of series of bearing standards mounted thereon, tubular corner columns connected to some of said bearing standards and posts therein, a table or platform connected to the upper ends of said posts and supported thereby and means connected to said tubular corner columns for holding the posts and the table in the desired relation, a traveling carriage mounted upon said table, rollers forming part of said traveling carriage for facilitating the movement thereof, arms projecting from said carriage toward one end of the machine and a sucker arm carried thereby, means for effecting a vacuum or sucker action of said arms, a table for supporting the superposed pile of filling-in sheets, a platform carrying the same and means for supporting said platform and guiding the same, and other means for raising the platform progressively as the sheets are removed.

7. In a machine of the class described, the combination with a bed, of series of bearing standards mounted thereon, tubular corner columns connected to some of said bearing standards, and posts therein, a table or platform connected to the upper ends of said posts and supported thereby and means connected to said tubular corner columns for holding the posts and the table in the desired relation, a traveling carriage mounted upon said table, rollers forming part of said traveling carriage for facilitating the movement thereof, arms projecting from said carriage toward one end of the machine and a sucker arm carried thereby, means for effecting a vacuum or sucker action of said arms, a longitudinally movable table for a pile of superposed sheets placed beneath the table supports of said carriage, a platform on which said sheet-table is mounted and supported for movement and a sliding support for said platform, means for raising the platform with a step by step motion and for intermediately holding the same as raised and other means manually actuated and permitting the sheet-table and its support platform to be returned to an initial position.

Signed by me this 17th day of February 1911.

FRANK J. EBERLE.

Witnesses.

GEO. T. PINCKNEY,
E. ZACHARIASEN.