L. E. MORRISON.

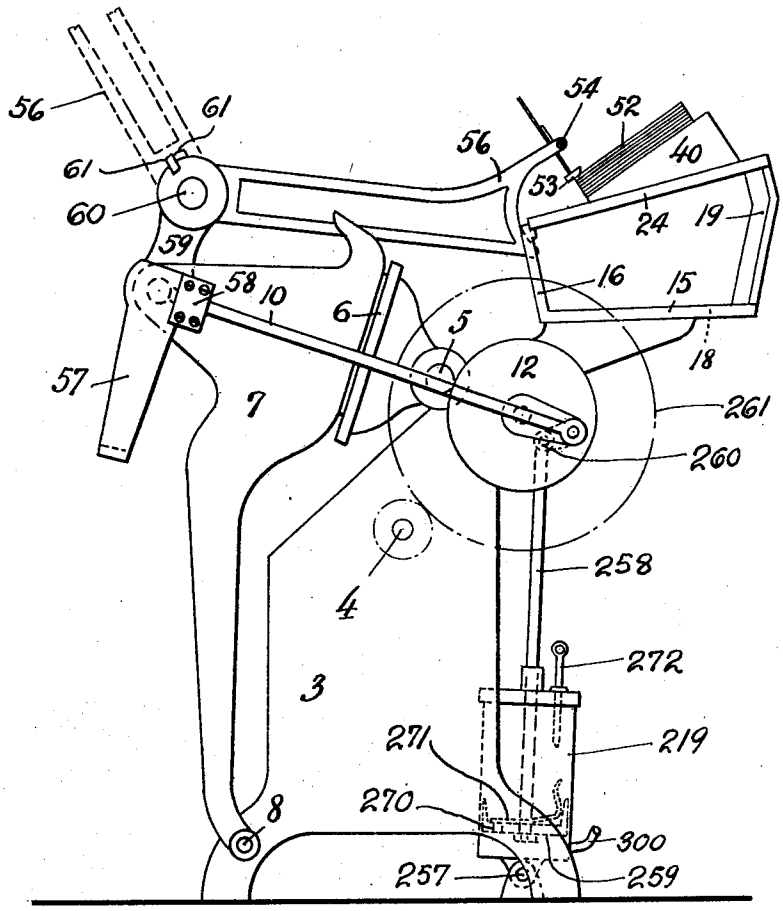
PAPER SEPARATING AND FEEDING MECHANISM.

APPLICATION FILED JAN. 20, 1920.

1,394,181. Patented Oct. 18, 1921.

3 SHEETS—SHEET 1.

Fig. 1



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3 SHEETS—SHEET 2.

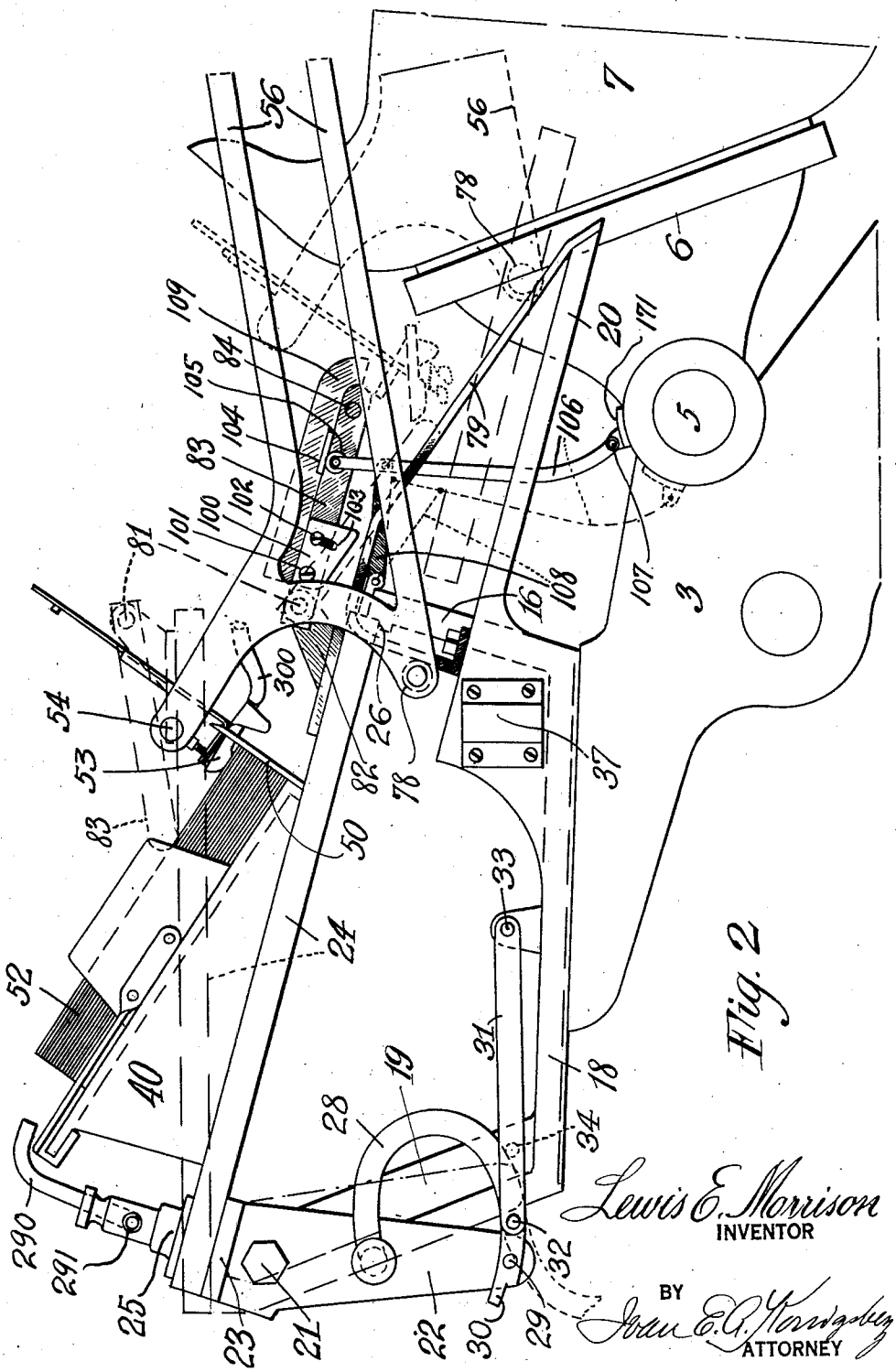


Fig. 2

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3 SHEETS—SHEET 3.

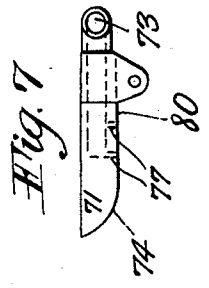


Fig. 7

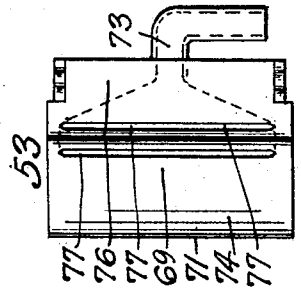


Fig. 6

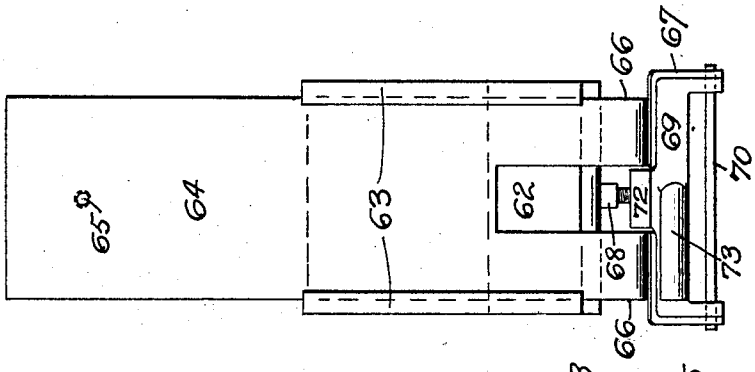


Fig. 5

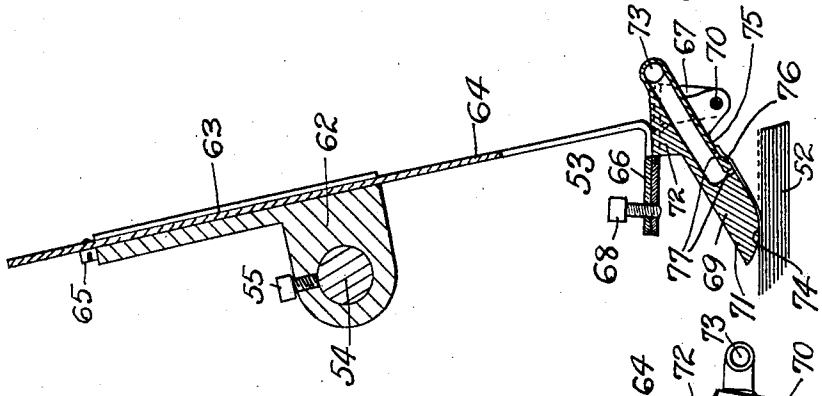


Fig. 4

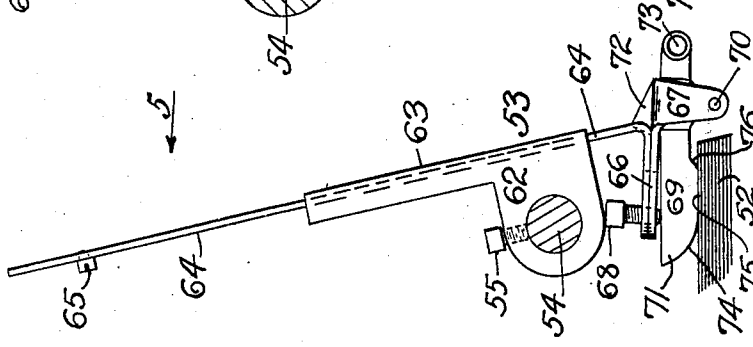


Fig. 3

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UNITED STATES PATENT OFFICE.

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PAPER SEPARATING AND FEEDING MECHANISM.

1,394,181. Specification of Letters Patent. Patented Oct. 18, 1921.

Original application filed May 29, 1919, Serial No. 300,702. Divided and this application filed January 20, 1920. Serial No. 352,749.

To all whom it may concern:

Be it known that LEWIS E. MORRISON, a citizen of the United States, and resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Paper Separating and Feeding Mechanisms, of which the following is a specification.

This invention relates to improvements in paper separating and feeding mechanisms for use on job printing presses of the type of the well known Chandler and Price job press. The invention is, however, not exclusively limited to any particular type of job printing press. One object of the invention is to provide a paper separating and feeding mechanism peculiarly well adapted for use in connection with a printing mechanism such as is disclosed in my pending application Serial Number 300,702, from which this application is a divisional application. Another object is to provide a generally improved paper separating and feeding mechanism. Still another object is to provide an improved type of separator nozzle for separating the top sheet from the pile of sheets.

With the foregoing and other objects in view, my invention comprises a paper separating and feeding mechanism as hereinafter described and claimed and as illustrated in the accompanying drawings in which—

Figure 1 is a general view of a job printing press showing the application of my invention;

Fig. 2 is a right hand side view of the upper parts of the press showing the separating and feeding means operation;

Fig. 3 is a sectional detail view of the separating nozzle shown in position on top of the pile of sheets just prior to the separation of a sheet from the pile;

Fig. 4 is a similar view showing the nozzle in position as picking up the separated sheet;

Fig. 5 is a front view of the nozzle looking in the direction of arrow 5 in Fig. 3;

Fig. 6 is a bottom view of the nozzle;

Fig. 7 is a detail view of a modified nozzle.

The press as illustrated in outline only is a typical job or platen press. The frame of the press is denoted in general by the reference numeral 3. 4 is the driving shaft; 5 the platen pivot; 6 the platen; 7 the form member pivoted at 8. 9 indicates the inking mechanism. 10, 10 the connecting rods and 12 the platen locking cam.

On the left side of the press and suitably secured to the frame 3 is a bracket 15, having a rearwardly inclined upright 16. Similarly on the right side of the press there is a bracket 18, Fig. 2, having an upright 16 and a forwardly inclined upright 19 and a cam support 20. On the upright 19 there is pivoted at 21 a bracket 22 which forms a supporting ledge at 23 for the feed table 24, pivoted at 25 to the said support 22. The feed table rests normally on the said two uprights 16, 16 which are provided with shoulders 26, 26, for this purpose. It is further adapted to be raised or swung in a vertical plane on the pivot 21 as shown dotted in Fig. 2, and after having been thus raised, the feed table is movable laterally or may be swung horizontally on the pivot 25.

The feed table and the bearing support 22 are swung vertically as one piece by the following means, see Fig. 2. 28 is a curved lever pivoted at 29 to the bearing 22 and having a tail stop 30. 31 is a link pivoted at 32 to the lever 29 and at 33 to the bracket 18. 34 is a stop pin in the lever 31. The parts are in the normal position as shown in Fig. 2 where it will be observed that the lever 28 rests against the stop pin 34 and the pivot 32 is below the level of the pivots 29 and 33 so that there is a dead lock as will be understood. When it is desired to raise the feed table, the lever 28 is pulled forward and downward into the dotted position shown, whereby the bracket 22 is moved rearward as shown and the feed table lifted off the uprights 16, 16, and into horizontal position as indicated. When the lever 28 is moved into its lowermost position, the tail stop 30 abuts the stop pin 34 on the under side thereof, and the pivot 29 now comes between the pivots 32 and 33 and is deadlocked as indicated. Thereafter the feed table may be swung horizontally to the right and a hand feed board (not shown) may be placed in a socket 37 and the press may then be hand-fed and hand delivered. By movements in the opposite direction, the feed table is brought back laterally over the

frame and is then lowered to rest on the brackets 15 and 18 on the parts 16, 16 thereof. On top of the feed table rests the paper board 40 which supports the pile of paper 52 with the leading edge against the paper stops 50.

The top sheet is separated from the pile of paper 52 and fed to the platen by the suction nozzle 53. See Figs. 3 to 7 inclusive, also Fig. 1. The nozzle is carried on a supporting rod 54 and is adjustably secured thereto by a set screw 55. The rod is fixed to a nozzle arm 56. To the connecting rods 10, 10 there is secured a U-shaped bracket 57, by means of clamps 58. The base or bottom of the U-shaped bracket passes across the press at the rear. One arm of the U, on the right side of the press, is extended upward and forms a support 59 for the nozzle arm pivot 60. It follows, that as the form member moves back and forth the nozzle arm with the nozzle is moved likewise and the paper, after having been picked up by the nozzle, is transferred from the pile and to the platen, as will be hereinafter more specifically set forth. 61, 61 are coöperating stops on the nozzle arm 56 and support 58 respectively whereby the arm may be swung upward into the dotted position shown in Fig. 1 and thus the nozzle moved out of the way whenever desired.

The nozzle itself comprises the supporting body 62 provided with guide ways 63. In the latter slides the nozzle bracket 64 which falls in said guides by gravity until the stop 65 rests on the top of the body 62, see Fig. 4. The nozzle bracket has a foot 66 to which are secured depending ears 67, 67. 68 is an adjustable stop. The nozzle 69 is pivoted at 70 in the said ears and has a forwardly projecting relatively heavy head 71 and a stop 72. The nozzle 69 is hollow and provided with a pipe connection 73. The nozzle head has a curved paper engaging and curling surface 74 and a straight paper pick up surface 75 formed with a shoulder 76 between the two openings or slits 77, 77. The nozzle arm 56 carries a cam roller 78 which runs on the nozzle cam 79 secured to the aforesaid cam support 30, see Fig. 2.

When the press is open the nozzle arm is in the dotted position in Fig. 2, the roll 78 being at the foot of the cam, and the nozzle 69 hangs in the position shown. When now the press closes, the nozzle arm is moved forward into the position shown in full lines in Fig. 2, and guided in its movement by the cam 79, until the supporting rod 54 has reached its final forward position, where the nozzle is brought to rest upon the paper as shown in Fig. 2 and enlarged in Fig. 3. As the pile of paper decreases, the nozzles drop deeper as will be understood.

When the nozzle comes to rest upon the paper, the head of the nozzle is brought up against the stop 68. At this moment the suction occurs, as hereinafter explained and at the same time the press opens and the nozzle support is lifted and moved up and away from the nozzle which falls as it were, see Fig. 4. The top of the body or bracket 62 abuts the stop 65 and lifts the nozzle bracket 64, thereby causing the nozzle to fall forward as shown until its stop 72 hits the foot 66. The fall of the nozzle around the pivot 70 causes a forward sliding movement of the top sheet of the paper—away from the leading edge. The sucking up of the paper by the two slits 77 causes a buckling or crimping of the paper against the shoulder 76. The sliding movement away from the leading edge of the paper underneath and the crimping of the sucked up sheet together causes perfect separation from the pile.

The paper is then carried in over the platen and at the proper time, the suction ceases to act, and the sheet is dropped upon the transfer table.

The modified nozzle shown in Fig. 7 lacks the shoulder 76 and the bottom straight picking up surface 80 is rearwardly inclined. This nozzle is intended for use on heavy paper or cardboard where crimping is not possible and where a somewhat more accentuated bending of the sheet is desirable.

The transfer table receives the paper from the separating means and transfers it to the platen. The table comprises a shaft 81 pivoted in brackets 82 (one on each side of the press) and side arms 83 in the lower ends of which a shaft 84 is journaled. The shaft 84 is constantly rotated by means not shown, but which are disclosed in my application Serial Number 300,702. The table is raised and lowered to permit of the usual operations of the platen by means of a stop 100 pivoted to the table arms 83 at 101 and adjustable by screw and slot 102 and 103. The arm 83 also carries a lip 104 adapted to rest on a roller 105 carried by an arm 106 pivoted to the platen at 107 and connected to the fixed upright 16 at 108. The respective raised and lowered positions of the table are shown in Fig. 2 in full and dotted lines.

The means for supplying suction to the separator nozzle consists of a pump 219 pivoted to the floor at 257 and the piston rod 258 from the pump piston is connected at 260 to a gear 261 on the press. The nozzle 53 is connected to the pump by a hose 300. Means are also provided for adjusting the release of the sheet from the nozzle at the right point over the platen depending upon whether the sheet is long or short. The pump piston is apertured at 270. A pivoted cover 271 covers the hole 270. 272 is an adjustable stop depending through the

pump top. On the suction stroke of the piston 259 the cover 271 will be depressed by the stop when the latter is reached, the air hole will be uncovered and air admitted below the piston, consequently the sheet will be released from the nozzle 53. To facilitate the separation of the top sheet, a nozzle 290 is provided which is connected to the pump by a hose 291 and blows a blast of air on the pile of sheets 52.

The separating means herein described have been found to operate perfectly, even in separating very thin sheets of paper. It will also be understood that I do not desire to limit myself with respect to the foregoing, but that changes in the detailed construction may be made within the scope of the appended claims.

I claim:

1. A paper separating device of the character described comprising supporting means, a bracket slidably held therein, a suction nozzle pivoted on said bracket, a stop on the latter for limiting the movement of the nozzle on its pivot in one direction and a stop on the nozzle for limiting its movement in the opposite direction.

2. A paper separating device of the character described comprising supporting means, a bracket adapted to move in said supporting means by gravity, a suction nozzle movably supported on said bracket, an adjustable stop on the latter for limiting the movement of said suction nozzle in one direction and a fixed stop on said nozzle for limiting its movement in the opposite direction.

3. A paper separating device of the character described comprising supporting means, a suction nozzle, means for movably securing the latter on said supporting means, said securing means being adapted to move by gravity in said supporting means, mechanism for pivoting said nozzle on the said securing means, whereby said nozzle is adapted to fall by gravity with respect thereto.

4. A suction nozzle of the character described comprising a substantially rectangular body having a relatively heavy forward portion and a hollow interior, said nozzle being provided with two suction openings in its bottom in the form of slits therein, said bottom having a shoulder formed between said slits.

5. A suction nozzle of the character described comprising a body portion having a flat upper surface, a stop thereon, a bottom surface composed of a curved forward portion and a flat rear portion, a shoulder formed across said body in the bottom surface thereof and suction openings located in said bottom surface on both sides of the said shoulder.

6. A suction nozzle of the character described comprising a body portion having a hollow interior and a downwardly extending curved surface merging into a flat bottom surface, a shoulder formed in the latter and suction openings located on each side of said shoulder.

7. In a printing machine, the combination of means for supporting the paper to be printed, a movable form member, paper separating means pivoted on said form member, a fixed cam for guiding said separating means to the paper supporting means, said separating means being arranged to operate on the said cam by gravity.

8. In a printing machine the combination of a platen, paper supporting means, a movable form member, paper separating means pivoted thereon, means for guiding said separating means to remove a sheet of paper and place it on the platen and means permitting said separating means to be moved into inactive position.

9. In a printing machine, means for supporting the paper to be printed, paper separating means comprising a lever pivoted at its one end to the said printing machine, a suction nozzle pivoted on said lever, means for operating the latter to cause said nozzle to remove a sheet of paper and a cam for guiding the said pivoted lever during the movements thereof.

10. In a printing machine, means for supporting the paper to be printed, a platen, paper separating means comprising a lever pivoted at one of its ends to said printing machine, a suction nozzle pivoted on the said lever, means for oscillating the latter around a fixed point on the said printing machine and means for raising and lowering said lever around its said first named pivot to position the said suction nozzle in operative relationship to the said paper supporting means and the said platen.

11. In a printing machine, means for supporting the paper to be printed, a platen, paper separating means comprising a lever pivoted at one of its ends to said printing machine, a suction nozzle pivoted on the said lever, means for oscillating the latter around a fixed point on the said printing machine and a fixed cam for raising and lowering said lever around its said first named pivot to position the said suction nozzle in operative relationship to the said paper supporting means and the said platen.

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