INLAY-SHEET-SUPPLYING DEVICE.

SPECIFICATION forming part of Letters Patent No. 642,879, dated February 6, 1900.
Application filed June 27, 1899. Serial No. 721,995. (No model.)

To all whom it may concern:

Be it known that I, WALTER SCOTT, a citizen of the United States, residing at Plainfield, in the county of Union and State of New Jersey, have invented an Improvement in Intermediate or Inlay Sheet Supplying Devices, of which the following is a specification.

It is often necessary to place sheets of paper between the sheets upon which the impression has been made, and this is especially necessary immediately after the printing operation, in order that there may not be any blurring of the ink or any offset from one sheet to another.

In my present invention the sheets are delivered successively as printed, and there is a pile of inlay-sheets that remains stationary and a suction or similar device is connected with the grippers that deliver the sheet, so that the printed sheet is drawn out from the delivery apparatus, and at the same time the inlay-sheet is taken from the top of the pile and the two are moved along together, and as they reach the place of ultimate delivery both sheets are disconnected from the moving device and subside upon the pile, and said moving devices return above the sheets to the place of beginning for taking a second printed sheet and a second inlay.

In the drawings, Figure 1 is a side view, partially in section and diagrammatic, representing the delivering devices. Fig. 2 is a view endwise of the parts, some of them being broken so as to occupy less space. Fig. 3 is an elevation of the worm and gear for raising the sheet-table. Fig. 4 is a plan of the dog and ratchet-wheel that act on the sheet-table. Fig. 5 is a side view, in larger size, of the devices for raising one end of the sheet-holding table, showing also a modification of the device for moving the same. Fig. 6 is an elevation of the disk and connections to the driving-shaft and disk—that is, the motor for raising the sheet-holding table. Fig. 7 is a view of the modified device for taking off a slip-sheet, and Fig. 8 illustrates the slip-sheets near the end of its movement in drawing off a sheet.

A portion of the frame of the machine is represented at A, and the impression-cylinder is illustrated at B, and the belts or tapes C convey the printed sheet to the delivery-rolls C'. These parts may be of any desired character, and the grippers D upon a carriage E are made use of in receiving the paper from the delivery-rolls C and conveying the same to the place of ultimate discharge and delivery. I have shown a table at F for receiving the printed sheets and the inlay-sheets. I remark that the devices for giving motion to the carriage E may be of any desired character. I, however, prefer and use those hereinafter described.

The table G receives upon it the pile of intermediate or inlay sheets G', and those sheets may be of any desired character, and said table is pivoted at 3 at the back end, and the front end can be raised or lowered so as to bring the top sheets to about the same level for the device which grasps the top inlay-sheet P and carries the same away to be delivered with the printed sheet, so as to come between one impression and the next. I remark that this improvement is represented as connected with a two-revolution reciprocating-bed press; but I do not limit myself to the use of this improvement with this character of press.

The carriage E is fitted to move upon tracks R', (see Fig. 2,) and I have represented the device for giving motion to this carriage as a rack I, that receives a reciprocating motion from a gear-wheel T.

I have shown the bevel-gears K, shaft L, and second set of bevel-gears M and horizontal shaft N, which has a pinion I' driven by a rack P' on the bed P as the means by which the rack I is moved back and forth in harmony with the main bed P of the press, and this rack I gears into a wheel O, having its shaft or gudgeon upon the carriage E, and a second gear-wheel P is connected with the gear-wheel O, so that as the rack I is moved endwise by the gearing before described it carries with it the gears O and P, and in consequence of the gearing P being in engagement with the stationary rack Q, such gear P is rotated as it is moved bodily along by the rack I, and in its rotation the gears O and P are revolved, causing the gear O to overrun the rack I, so that the carriage E travels twice the distance of the motion given to the rack I, and by this means a sufficient movement is given to the carriage to draw the printed sheet along out of the press and also
to draw the inlay-sheet the same distance from the pile of sheets G. I remark that the carriage E may be of any desired construction; but I prefer to construct the same with rollers or small wheels R running on the track R', so that the carriage will move with freedom under the action of the gearing aforesaid.

Any suitable device may be made use of for seizing the top sheet in the pile G of inlay-sheets. I have, however, represented a tubular shaft 6 at the ends of the arms 7, that are pivoted to the stationary arms 8 upon the carriage E, and these arms 7 extend out from the shaft 9, that is received at its ends in the arms 8 of the carriage E, and there is a crank-arm 10, that extends out from the shaft 9 and is provided with a roller running in the stationary cam S, so that as the carriage is moved along by the devices aforesaid the crank-arm 10 of the shaft 9 nearly turns and the outline of the stationary cam, and the shaft of this cam is substantially such as represented, so that the tube 6 will be moved toward the pile of inlay-sheets at the end of the stroke of the carriage as it comes toward such pile of sheets and then it will be lifted as the carriage is moved away from that pile. The object of this construction is that the suction-nipples 11 will be brought down upon the top sheet of the pile of inlay-sheets near the end of such pile, and at this time a suction is brought into action to withdraw the air from the tube 6, so that the nipples 11 will hold the top sheet such as nipples and the tubular shaft 6 are raised, and in this way the inlay-sheet will be withdrawn from the top of the pile by the motion that the carriage and nipples receive. The arms 7 are swung with and by the shaft

and in so doing the sheet is first grasped by the suction action, raised slightly as the roller runs up the incline, and then the carriage having moved back from the pile of sheets the cam carries the arms and suckers downward, bringing the sheet closely adjacent to the printed sheet as they are allowed to subside upon the receiving-table F. It is desirable that the ends of the suction-nipples remain in line with the sheet as the nipples are carried down by the arms 7, and to effect this operation a rod 13 is pivoted to the arm 8 and extends to an arm 35 on the tube 6, so that there is a parallel-motion action that causes the suction-tube 6 to swing sufficient to bring the lower ends or mouths of the nipples 11 level, or nearly level, in the plane of the sheet that is taken from the pile, so that the suction action may remain fully in operation in holding the sheet by the nipples.

The suction action to the tube 6 and nipples 11 may be of any desired character. I have represented the cylinder T and a piston within it, having a rod and link to the lever T', that receives its motion from the cam T, that is rotated by the shaft V and bevel-gears 33 and 34 in unison with the other parts of the press, and this cylinder exhausts the air by the flexible pipe 14 to the tube 6, and the parts are so timed that the suction action is applied immediately after the carriage has reached the extreme movement toward the pile of inlay-sheets, at which time the suckers have been brought down by the action of the cam S upon one end of the top sheet of the pile of sheets.

I remark that the grippers D may be actuated by any suitable means to seize the sheet as it is delivered by the tapes C and delivery-roll C', and they are to be opened to discharge the sheet near the end of the movement of the carriage E. It is important to maintain the pile of sheets so that the top sheet adjacent to the suction-nipples will always be at or near the same height, and with this object in view the end of the table G is raised gradually, the same being turned on the pivots 3. Any convenient mechanism may be employed for this purpose, but it is convenient to make use of a rack 15 at the swinging end of the table and extending downward, and a pinion 16 engaging such rack, and by the turning of which pinion the rack and the table are raised or lowered. Any suitable means may be made use of for revolving this pinion 10; but I find it convenient to place a pinion 17 upon the shaft of the pinion 10, which pinion engages a worm 18 upon a vertical shaft that is provided with a ratchet-wheel 19, engaged by a pawl 20, so that the same is turned gradually by the pawl, and it is convenient to employ a second pawl 21 upon a vertical shaft supported by an arm 22, extending out from the lower end of the stationary shaft that supports the worm-pinion 18, and this arm 22 receives its motion from the carriage E, and the paws 20 and 21 take up one or more teeth upon the ratchet-wheel 19 as the arm 22 receives its motion from the carriage E as it reaches the end of its stroke. Hence by this device the pinion 16 is moved gradually but very slowly to raise the end of the table G to the proper extent, according to the thickness of the sheets that are removed progressively from such table, as aforesaid.

As the sheets vary in thickness upon the table G it is often advantageous to be able to adjust the movement given to the rack 15 by the worm-pinion 18, and I find a convenient manner of doing this is to employ a disk U, that receives a continuous or progressive movement from the shaft V or other part of the press, and upon the shaft 23 of the worm-pinion 18 is a worm-wheel 32, meshing with a worm 30 upon the shaft 31, and upon said shaft 31 is a movable wheel 24, and as the shaft 31 occupies a radial position the wheel 24 may be moved nearer to the axis of the disk U or farther from the same, and in that way the speed of rotation of the worm 18 can be regulated for raising the moving end of the table G the amount which is necessary to keep the top sheet at the proper level to be acted upon by the suction-nipples 11. The
disk U is advantageously pressed toward the wheel 24 by a helical spring around the shaft. By applying a crank-arm 25 upon the shaft 20 the same may be rotated by hand to lower 5 the table G for the reception of a fresh pile of inlay-sheets.

In Fig. 7 I have illustrated a modification of the device for moving the suction-nipples. In this case the suction-nipples and their shaft 6 and flexible tube 14 are connected to slides 40, that move up and down in slide-ways E', connected to the frame of the carriage E, and the shaft 9 is pivoted upon this carriage, and the arm 7, extending out from 10 the same, is similar to the parts before described; but the arm 7 is connected by a link 28 to the slide-block carrying the air-shaft and nipples, and the groove S acts upon the arm 10 and roller, as before described, to draw down the nipples 11 and depress this end of the sheet as the sheet is pulled off the pile of sheets by the movements before described.

The suction may be by a pipe with openings only instead of having nipples, and any desired mechanism or device may be employed for seizing the inlay-sheet and drawing it off the pile of sheets and delivering such inlay-sheet upon the pile of sheets at the delivery end of the press.

30 I claim as my invention—

1. A pivoted table for receiving the pile of inlay-sheets, means for raising the table gradually as the sheets are taken off, in combination with suction-nipples, a carriage, a shaft and arms for supporting the suction-nipples, means for moving the carriage along gradually and for carrying the printed sheet therewith, and means for swinging the arms to lower the inlay-sheet and deliver the same simultaneously upon the top of the printed sheet, substantially as set forth.

2. The combination in a printing-press with the mechanism for delivering the printed sheet, of a carriage, means for moving the same longitudinally, grippers for receiving the sheet and by which the sheets are taken successively from the delivery mechanism and laid in a pile, a table for receiving the sheets and the inlay-sheets and a mechanism connected to and moving with the carriage for seizing the top sheet in the pile of inlay-sheets and drawing the same off simultaneously with the movement of the carriage that delivers the printed sheets, substantially as set forth.

4. The combination in a printing-press with the means for delivering the printed sheet, of a carriage and grippers, mechanism for reciprocating the same, a table for carrying a pile of inlay-sheets, a rack and pinion for raising the table and pile of sheets at one end and adjustable mechanism for varying the action of the table-raising mechanism according to the thickness of the sheets and mechanism for grasping the top sheet of the pile and conveying the same away simultaneously with the movement of the printed sheet, substantially as set forth.

5. The combination in a printing-press with the reciprocating sheet-delivery mechanism for the printed sheets, and a receiving-table below the same, means for sustaining a pile of sheets and an automatic sheet-delivery mechanism for removing the upper inlay-sheet, lowering and laying it upon the printed sheet simultaneously with the delivery of said printed sheet, substantially as set forth.

6. The combination in a printing-machine, of a table to support inlay-sheets, a table to receive the inlay and printed sheets, a reciprocating carriage and means for delivering the printed sheet, and means for seizing, lowering and delivering the inlay-sheet simultaneously with the printed sheet, substantially as set forth.

7. In a printing-machine having an impression-cylinder and delivery-tapes to deliver the sheets from the impression-cylinder, a reciprocating sheet-carrier, a table for receiving the inlay-sheet above the feeding-tapes with its front edge above the place where the sheets are fed to the carrier, a sheet-seizing device and means for moving the same to carry the sheet to the place of delivery, and means for seizing the inlay-sheet at the pile and delivering it on the receiving-table, substantially as set forth.

8. The combination in a sheet-delivery apparatus, of belts and grippers for seizing the printed sheet, means for moving the grippers and carrying the sheet to the place of delivery, a table for receiving and supporting the inlay-sheets, means for gripping and moving the top sheet in the pile of inlay-sheets and for delivering the same simultaneously and upon the printed sheet, substantially as set forth.

Signed by me this 23d day of June, 1899.

WALTER SCOTT.

Witnesses:
WM. S. FERGUSON,
ALBERT L. THOMAS.