

O. S. BEYER.
SHEET MANIPULATING DEVICE.
APPLICATION FILED APR. 21, 1908.

946,100.

Patented Jan. 11, 1910.

2 SHEETS—SHEET 1.

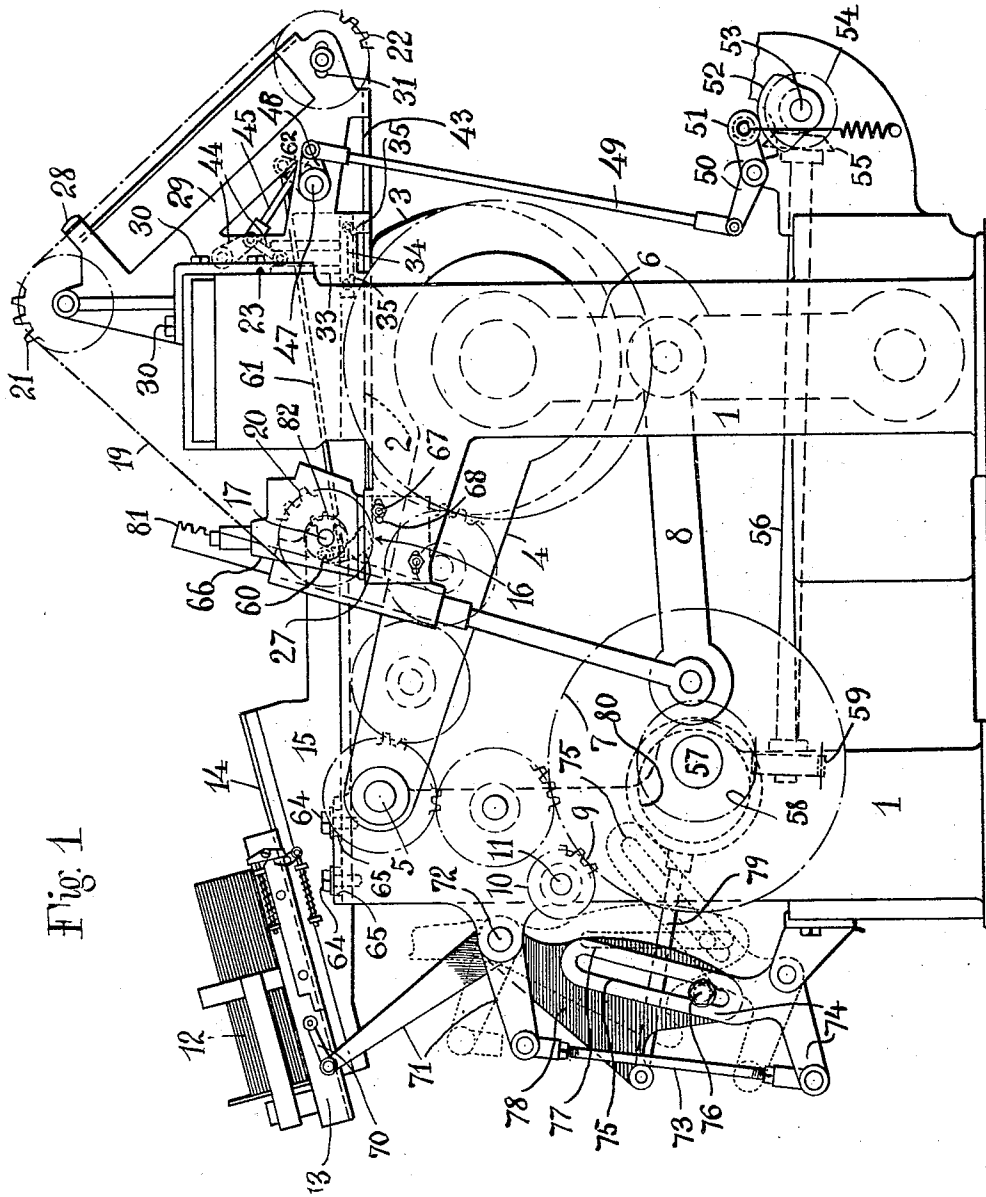


Fig. 1

Witnesses
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Inventor

By his Attorney

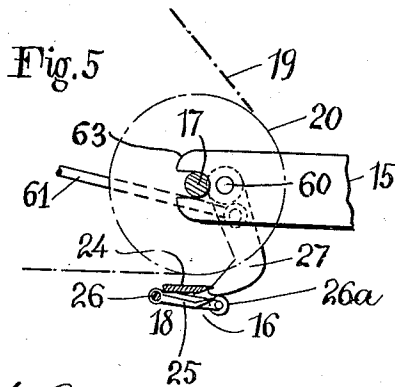
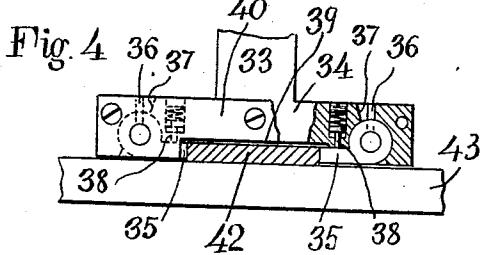
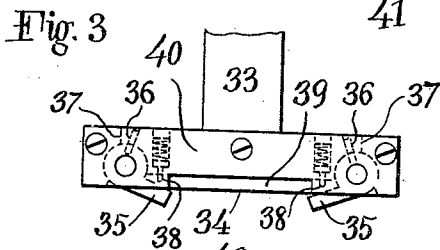
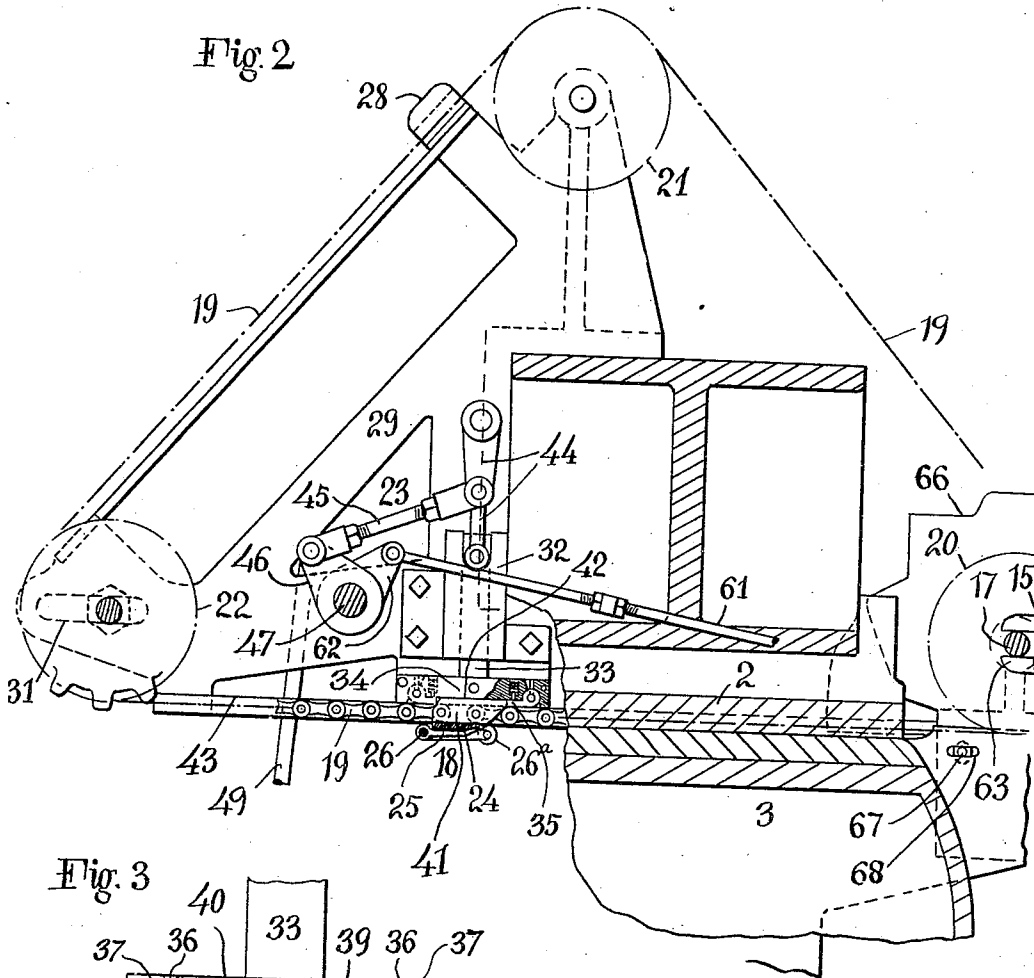
Joan E. A. Gonningsberg

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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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SHEET-MANIPULATING DEVICE.

946,100.

Specification of Letters Patent. Patented Jan. 11, 1910.

Application filed April 21, 1908. Serial No. 428,459.

To all whom it may concern:

Be it known that I, OTTO S. BEYER, a citizen of the United States, and a resident of East Rutherford, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Sheet-Manipulating Devices, of which the following is a specification.

This invention relates to sheet manipulating devices for printing or other machines and has for its particular object to provide novel and useful means for properly registering a sheet in a printing position and also to provide certain mechanisms whereby the various parts of the sheet manipulating device may be adjusted in a simple and effective manner.

In the following specification and in the accompanying drawings I have shown my invention as applied to an automatic job press, in which the paper is separated by any suitable automatic separating and feeding mechanism and further conveyed through the press by a gripping device operated by an endless conveyer. The grippers seize the sheet at the front of the platen, convey the sheet into position to be printed and deliver the printed sheet, and it is the special object of this invention to provide automatic means for positioning the grippers at a certain point, while the printing takes place and also to provide means for adjusting the other elements of the sheet manipulating means with relation to the said positioning means, whereby the necessary adjustments may be easily and quickly made with the assurance that the sheet will be placed at the same point on the platen at the time of printing.

To this end my invention comprises such elements and parts and features of construction as will hereinafter appear.

In the said drawings: Figure 1 is a side elevation of a printing press embodying my invention; Fig. 2 is a detail view looking toward the inside of the right hand frame and showing the positioning or registering means in operation. Figs. 3 and 4 are detail views of the registering cross head and adjacent parts and Fig. 5 is a detail view of parts of the gripping mechanism.

1 denotes the frame for suitably supporting the various parts.

2 is the stationary platen, while 3 is the

oscillating form member, which is suspended in arms 4 pivoted at 5 and operated by toggle links 6, 6 connected to crank disk 7 by connecting link 8. The crank disk carries a gear 9 which meshes with the pinion 10 on main shaft 11 to which power is applied in any suitable form.

The sheet separating and feeding mechanism need not be described in detail except as to state that the sheets 12 are supported in a carriage 13 sliding on rails 14 on the bracket 15. As the carriage is reciprocated on the rails, the bottom sheet is separated and fed by suitable mechanism, not shown, to the grippers, which seize the sheet at a point 16 below the shaft 17, see Figs. 1 and 5.

The grippers 18, Figs. 2 and 5, are carried by the endless conveyer 19 which latter is operated by sprocket wheels 20, 21 and 22 of which the first mentioned is the driver. After the sheet has been seized by the grippers, it is carried underneath the platen at the rear end of which is located the registering mechanism 23. The endless conveyer is operated intermittently by rack 81 and gear 82 with a ratchet and pawl mechanism interposed between them such as is well known in the art of mechanics and not shown in detail; and as soon as the grippers, which carry the fresh sheet, have reached the position shown in Fig. 2, they are seized by the registering mechanism and positioned so that the sheet which they carry will be in the proper position under the platen and the printing will be done with exact register.

The grippers, of which there may be as many sets as the size of the machine conveniently will permit, comprise a bar 24 forming the upper gripper jaw and the lower gripper jaws 25 are carried by the gripper shaft 26, which latter is supported from the bar 24 in any suitable manner. On one end of the gripper shaft is mounted a lever carrying a roll 26^a which is adapted to cooperate with the gripper opening cams 27 and 28 for the purpose of seizing and delivering the sheet. The grippers are normally held closed by a spring and are otherwise arranged in a manner usual and well known in this art and need not be described in detail. When the grippers reach the point 16 they are opened by the cam 27

to seize the sheet, see Fig. 5, and after the printing has taken place, the grippers travel around the sprocket wheel 22 and are opened by the cam 28 and the sheet is deposited in a suitable receptacle, not shown.

Immediately in the rear of the platen there are provided delivery brackets 29 one on each side, but as they together with their adjacent parts are substantially alike, only one will be described. The two sprockets 21 and 22 and the opening cam 28 are carried by this bracket, which is bolted to the frame as shown in Fig. 1 by bolts 30. The sprocket wheels 22 are adjustable in slots 31 in the delivery brackets. On the inside of the delivery brackets there is bolted a cross head guide 32 in which slides vertically a stem 33 carrying the cross head 34. In the latter are pivoted two fingers 35 the normal position of which is as shown in Fig. 3, that is, they hang by their own weight beneath the cross head, and their downward motion is limited by the pins 36 moving in slots 37 and accelerated by the spring seated plungers 38. The cross head is cut out as at 39 and a cover plate 40 keeps the various parts in place. This will readily be understood from Figs. 2, 3 and 4.

Each gripper bar is carried in the conveyor 19 by a bracket 41, which takes the place of a link and this bracket is formed with a horizontal lip 42 extending outwardly from the center of the press and as the grippers are conveyed between the sprockets 20 and 22 the lips 42—one on each end of each gripper bar—slide on the rails 43, guiding the grippers in a horizontal plane. When the grippers reach the position in the rear of the platen, the cross head 34 descends until it reaches the top of the side rails 43 and the fingers 35 grip the lip 42 on either side and thus registers the gripper bar in the same position, once to every revolution of the machine. This is clearly shown in Figs. 2 and 4. The motion of the fingers 35 when the cross head reaches the rail 43 is an upward and inward motion, which causes these fingers to grip the lips 42 and accurately center the same under the cross head.

It is obvious that the means for registering the grippers must be yielding to a certain extent, so as to be able to shift the gripper bar slightly, in case it should not stop at the same point, and the construction as here illustrated and described permits of fitting the parts to a nicety and of easy removal for repairs in case of wear. Just before the printing is finished the cross head is moved up and the grippers are free to be conveyed to the point of delivery.

The cross heads on either side are operated by toggle links 44, which in turn are actuated by connections 45 and arms 46, which latter are fast on a transverse rock-

shaft 47. This rockshaft is oscillated by arm 48, link 49 and bell crank 50 (see Fig. 1), which latter carries a cam roll 51 co-acting with cam 52 on shaft 53. This shaft carries a bevel gear 54 meshing with bevel gear 55 on shaft 56, which latter is driven from shaft 57 by means of spiral gears 58, 59. Thus the rockshaft 47 is rocked twice to every revolution and causes the cross head to operate on the grippers.

The gripper opening cam 27 is pivoted at 60 on the bracket 15, see Figs. 1 and 5, and is operated to open the grippers by the connecting rod 61, which is pivoted to bell crank 62 also carried by the rockshaft 47, so that as the cross head descends to register the grippers with the sheet to be printed, the grippers at the point 16 are being opened by the swinging motion of the cam 27 seen in Fig. 5, thus proper timing of the manipulation of the sheet is assured.

It has already been stated that the bracket 15 carries the sheet separating and feeding mechanism, which may be of any suitable construction and this bracket ends in forks 63 which straddle shaft 17 and is bolted to the frame by bolts 64 which pass through slots 65, whereby adjustment longitudinally of the machine is provided for. The shaft 17 is carried by brackets 66 which are bolted to the frame by bolts 67 passing through slots 68, whereby an adjustment also longitudinally of the machine is possible. So it will be understood, that when for one reason or another, such as wear or stretching of the chain 19, it is necessary to adjust the sheet manipulating devices, it is done quickly and easily by loosening the bolts 64 and 67 on either side of the machine and sliding the brackets 15 and 66 until the necessary adjustments are obtained. And in a similar manner the rear sprocket shaft is adjusted in the slot 31 in the delivery bracket as already pointed out. By these means of adjustment the position and consequently the exact working of the cross head is never disturbed, which is of great importance, as the registering of the grippers by the cross head is dependent upon the latter's position with relation to the platen and to the exact point of printing which does not change. So it will be understood that the principle of the construction of these various adjusting devices is this, that the adjustments shall take place away from the cross head as the centering point, which is never disturbed. But still another matter of adjustment is provided for in this invention, and that is adjustment of the stroke of the sheet carriage 13 on the rails 14 depending upon the size of sheet handled. This will now be described.

The carriage 13 is reciprocated by means of the link 70 and bell crank 71 fixed on rockshaft 72. To the one arm of the bell

crank is pivoted the connection 73, the lower end of which is pivoted to the one arm of a bell crank 74. This bell crank 74 is provided with a slot 75 in which a pin 76 is adapted to be adjusted. This pin passes also through another slot 77 in the lever 78 pivoted loosely on shaft 72. Lever 78 is swung by means of a rod 79 reciprocated by the eccentric 80 on shaft 57. Thus, as the eccentric rotates, the lever 78 is oscillated on its pivot and in turn rocks the bell crank 74 from which the movement is transmitted to bell crank 71 and to the paper carriage. Now when the throw of the latter is to be shortened, it is only necessary to lift the pin in the slots 75 and 77, this shortens the stroke of bell crank 74 and in this manner the exact stroke of the paper carriage is obtained in a simple and effective manner. I have shown in Fig. 1 in dotted lines the position of these various parts just described. A further slight adjustment may be made by the rod 73 which is provided with right and left threads as shown.

From the above it will be seen, that I have provided simple and easily operated mechanisms for effecting the various adjustments with relation to the handling of the sheet.

This invention is of course applicable to other machines than printing presses and various changes may be made within the scope of the invention.

I claim:

1. In a printing machine the combination of a sheet manipulation device comprising an endless conveyer, grippers carried by said conveyer, a vertically reciprocating member for registering the said grippers at a given point and means for adjusting the said endless conveyer on both sides of the said reciprocating member.

2. In a printing machine the combination of a sheet manipulating device, comprising an endless conveyor, grippers carried by the same, means for registering the said grippers at a given point and comprising a vertically reciprocating crosshead adapted to grip and center the gripper bar under the said crosshead, means for operating the latter and means for adjusting the said conveyer on both sides of the said crosshead and in directions toward and away from the same.

3. In a printing machine the combination of a sheet manipulating device, comprising an endless conveyor, grippers on the said conveyer, a bracket adapted to support the sheet separating and feeding mechanism, registering means for the said grippers and means for adjusting the said bracket with relation to the said registering means and

means for adjusting the said conveyer also with relation to the said registering means.

4. In a printing machine the combination of a sheet manipulating device, comprising a bracket adapted to support the sheet separating and feeding mechanisms, a sheet supporting carriage adapted to reciprocate on the said bracket, means for operating the said carriage comprising a rockshaft, an arm pivoted on said carriage and connected to said rockshaft, a driven shaft, an eccentric on the latter, a reciprocating rod operated by the said eccentric and movable slotted members interposed between the said reciprocating rod and the said rockshaft for imparting an oscillatory motion to the rockshaft.

5. In a printing machine the combination of a sheet manipulating device, comprising a bracket adapted to support the sheet separating and feeding mechanisms, a sheet supporting carriage adapted to reciprocate on the said bracket, means for operating the said carriage comprising a rockshaft, an arm pivoted on said carriage and connected to said rockshaft, a driven shaft, an eccentric on the latter, a reciprocating rod operated by the said eccentric and two movable slotted members interposed between the said reciprocating rod and the said rockshaft for imparting an oscillatory motion to the rockshaft, a connection between the said two slotted members for causing the slots therein to coact during the operation.

6. In a printing machine the combination of a sheet manipulating device, comprising a bracket adapted to support the sheet separating and feeding mechanisms, a sheet supporting carriage adapted to reciprocate on the said bracket, means for operating the said carriage comprising a rockshaft, an arm pivoted on said carriage and connected to said rockshaft, a driven shaft, an eccentric on the latter, a reciprocating rod operated by the said eccentric and two movable slotted members interposed between the said reciprocating rod and the said rockshaft for imparting an oscillatory motion to the rockshaft, a connection between the said two slotted members for causing the slots therein to coact during the operation, the said connection being movable in the said slots and serving as means for adjusting the motion of the said sheet supporting carriage.

Signed at New York in the county of New York and State of New York this 17 day of April A. D. 1908.

OTTO S. BEYER.

Witnesses:

IVAN KONIGSBERG,
M. RIEMANN.