Jan. 17, 1939. F. S. THOMPSON 2,144,037

SHEET-FEEDING MECHANISM FOR PLATEN PRINTING PRESSES

Filed May 21, 1937

FIG. 1

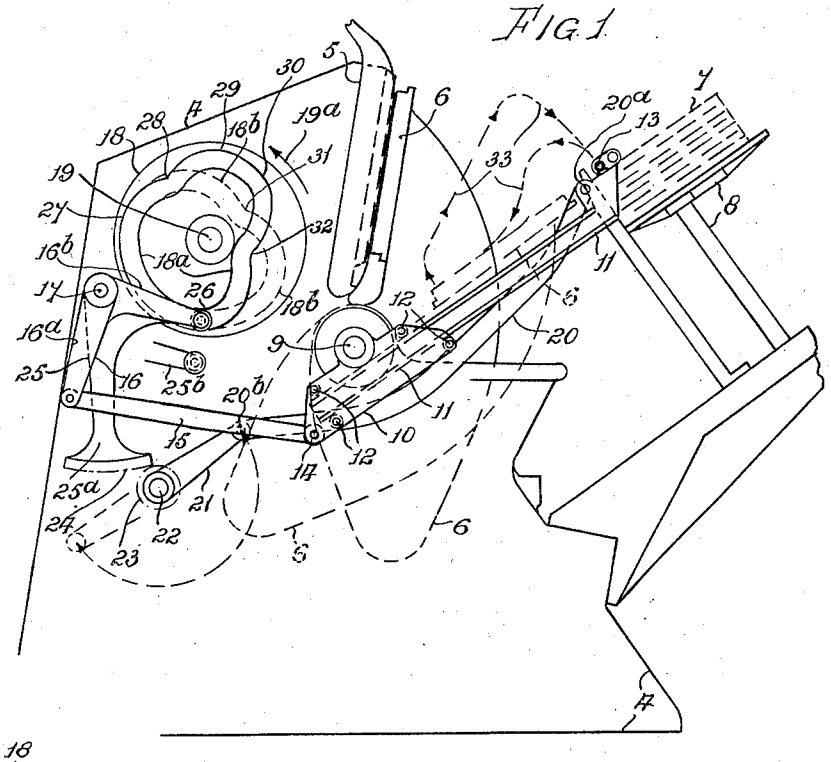


FIG. 2

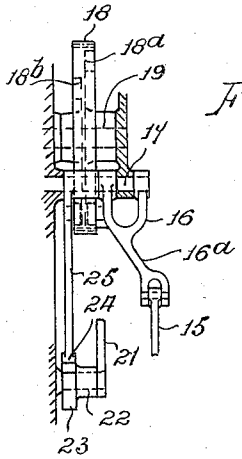
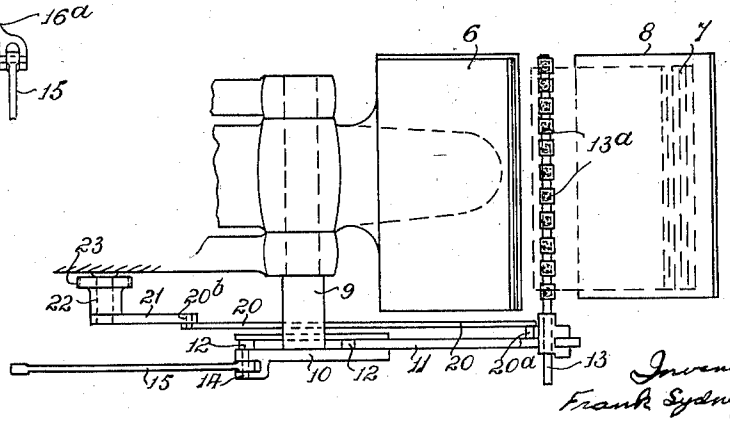


FIG. 3



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SHEET-FEEDING MECHANISM FOR PLATEN PRINTING PRESSES

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4 Claims. (Cl. 101—287)

This invention has reference to sheet-feeding mechanism for platen printing presses wherein a pile of sheets to be printed is arranged in front of the movable platen and the sheets are lifted and fed on to the platen by means of a sucker or suckers acting along their front edges.

In sheet-feeding arrangements of the type referred to, the sheet is lifted by the sucker or suckers during the fall or return movement of the platen, fed on to the platen and to the lays during the stationary or comparatively slow-moving open period of the platen and registered by the lays during the lift or forward movement of the platen, the sucker mechanism meanwhile returning ready to take the next sheet.

In any sheet-feeding arrangement the object must be to lay the sheet flat upon the platen and to place it as accurately as possible against the lays. The sheet should, therefore, be made to slide along close to the platen for the great part of its travel so as to exclude air from beneath it, and the travel should not vary from sheet to sheet. The mechanism, in particular, should be rigidly held at the moment when the suckers deposit the sheet against the lays and it should also be such as not to impede the operator in his access to the platen when the press is at rest.

The object of the present invention is to provide an improved sheet-feeding arrangement having the desirable characteristics indicated.

In a sheet-feeding arrangement according to the invention, the sucker or suckers is or are adapted to reciprocate to and fro to carry the front edge of a seized sheet to the lower edge of the movable platen and against the lays and after releasing the sheet to return to normal position, and to be also oscillated relatively to and with the platen in such manner that during its or their feeding movement it or they (the sucker or suckers) first carry the front edge of the sheet away from and then close to and along the face of the platen, and during its or their return movement it or they move well clear of the face of the platen.

The invention is hereinafter fully described with reference to the accompanying drawing in which Fig. 1 is a fragmentary more or less diagrammatic side elevation of a platen printing press comprising one embodiment of it, Fig. 2 is a fragmentary elevation looking on the left hand side of Fig. 1 and Fig. 3 is a fragmentary plan of Fig. 1. On the drawing only those parts necessary for elucidation of the invention are illustrated.

Referring to the drawing, 4 indicates the frame of the machine, 5 indicates the stationary platen that carries the type, 6 indicates the movable platen upon which the sheets to be printed are fed, said platen being shown in its raised or printing position in full lines, and in its lowered position in dotted lines, 7 indicates a pile of sheets to be printed carried on a support 8 arranged at the front of the machine.

On an extension of the fulcrum shaft 9 on which the movable platen 6 oscillates is pivotally mounted a guide or housing 10 in which a slide bar 11 is mounted to slide between anti-friction rollers 12. At its outer or upper end the slide bar 11 carries a suction tube 13 on which are provided suction nozzles 13a and which is connected with a source of suction in the usual way.

The guide or housing 10 is adapted to be oscillated on the fulcrum shaft 9. For this purpose the guide or housing 10 has connected to it at 14 one end of a link 15 the other end of which is connected to one arm 16a of a bell-crank lever 16 pivoted at 17 in the frame of the machine and having its other arm 16b provided with a bowl which engages in a cam groove 18a formed in one face of a cam disc 18. The cam disc 18 is mounted on a shaft 19 and is adapted to be rotated by any suitable means in the direction indicated by the arrow 19a to make one revolution for each complete operation (i. e. rise and fall) of the movable platen 6.

The slide bar 11 is adapted to be reciprocated in the guide or housing 10 by means of a connecting rod 20 one end of which is pivoted to the guide or housing at 20a and the other end of which is pivoted at 20b to a crank 21 mounted on a stub axle 22 and adapted to be oscillated through 180° from the position shown in full lines in Fig. 1 to the position shown in dotted lines and vice versa. The oscillations of the crank 21 are effected by means of a pinion 23 fixed to the boss of the crank and with which gears a quadrant 24 on one arm 25a of a bell-crank lever 25 (also mounted on the pivot 17) the other arm 25b of which lever is provided with a bowl which engages in a cam groove 18b formed in the other face of the cam disc 18. In Fig. 1 a portion of the arm 25b of the bell-crank lever 25 is shown below the arm 16b of the bell-crank lever 16 but it will be understood that with the parts in the positions shown in Fig. 1 the arm 25b lies immediately behind the arm 16b.

The cam grooves 18a and 18b are shaped as illustrated in Fig. 1 so that when the movable platen 6 is in the raised or printing position shown in full lines, the slide bar 11 is out of line with

said platen and is in its extreme outer or upper position with the suction tube 13 in position to pick up the top sheet on the pile 7. Following a pause of the platen at the printing position, the platen descends and during the first portion of its descent the printed sheet is removed from the platen by the usual delivery mechanism. During the pause and the first portion of the descent the bowls on the arms 16b and 25b of the bell-crank levers 16 and 25 traverse the concentric portions between the points 26 and 27 of the cam grooves 18a and 18b in the cam disc and there is no movement of either the guide or housing 10 or the slide bar 11. During the continued descent of the platen 6 the bowl on the arm 16b of the bell-crank 16 traverses the cam groove from the point 27 to the point 28 and causes the bell-crank lever 16 to rock the guide or housing 10 on the fulcrum shaft 9 in a counter-clockwise direction as viewed in Fig. 1, then from the point 28 to the point 29 causing the bell-crank lever 16 to rock the guide or housing 10 in the opposite direction back to its original position and finally from the point 29 to the point 30 during which traverse there is no rocking of the guide or housing 10 relatively to the platen 6. Simultaneously, with the described traverse of the bowl on the arm 16b of the bell-crank lever 16 from the point 27 to the point 30, the bowl of the arm 25b of the bell-crank lever 25 traverses the cam groove 18b from the point 27 to the point 31 and causes the bell-crank lever, through the quadrant 24 and pinion 23, to oscillate the crank 21 through 180° from the position shown in full lines to the position shown in dotted lines. This oscillation of the crank 21, through the connecting rod 20, reciprocates the slide bar 11 and with it the suction tube 13, inwardly or downwards. During the first portion of the subsequent rise of the platen the bowl on the arm 16b of the bell-crank lever 16 first traverses the cam groove 18a from the point 30 to the point 32 whereby the bell-crank lever is operated to rock the guide or housing 10 counter-clockwise, and then from the point 32 back to the point 26 whereby the bell-crank lever is caused to restore the guide or housing to its original position. Simultaneously, the bowl on the arm 25b of the bell-crank lever 25 traverses the cam groove 18b from the point 31 back to the point 26 and the bell-crank lever 25 is operated to oscillate the crank 21 from the position indicated in dotted lines back to the position shown in full lines which oscillation of the crank, through the connecting rod 20, reciprocates the slide bar 11 outwards or upwards back to the position. As a result of the described rocking movements of the guide or housing 10 and reciprocation of the slide bar 11, the suction tube 13 moves in the path indicated by the arrow-headed dotted line 33 in Fig. 1, during the last part of the descent of the platen 6 and the initial part of its subsequent rise. Thus, as the platen 6 approaches the position shown in dotted lines in Fig. 1, the suction tube rises above the line or level of the platen, carrying with it the sheet seized from the pile 7, and during the continued descent of the platen the suction tube carries the sheet above or over the platen, towards and on the platen, and down same to the lays, whereupon the sheet is released by admitting air into the suction tube in the usual way. During the initial portion of subsequent rise of the platen 6, the suction tube moves away from the platen and also upwardly and outwardly and then returns to its initial position ready to take the next sheet on the pile 7.

It will be noted when the slide bar 11 is in both its extreme outer or upper position and its extreme inner or lower position and the crank 21 is in its corresponding positions shown in full and dotted lines, respectively, the three centres 20a, 20b and 22 lie in a straight line thus giving positive or locked positions to the suction tube 13 and the suckers 13a.

I claim:—

1. In a platen printing press of the type described, a sheet-feeding mechanism comprising in combination suckers for picking up a sheet of paper, means for moving the suckers from a position to engage a sheet adjacent the outer edge of the platen to a position adjacent the inner edge thereof, said means including a pivotally mounted guideway, a bar slidably mounted in the guideway, and means for reciprocating the bar in the guideway comprising a crank and a connecting rod pivotally secured at one end to the crank and at the other end to the bar, the two pivots of the connecting rod being aligned with the crank in the two extreme positions of the suckers.

2. In a platen printing press of the type described, a sheet-feeding mechanism comprising in combination suckers for picking up a sheet of paper, means for moving the suckers from a position to engage the sheet adjacent the outer edge of the platen to a position adjacent the inner edge thereof, said means including a pivotally mounted guideway, a bar slidably mounted in the guideway, means for reciprocating the bar in the guideway, and means for oscillating the guideway.

3. In a platen printing press of the type described, a sheet-feeding mechanism comprising in combination suckers for picking up a sheet and delivering it to the platen of the printing press, and means for reciprocating the suckers from a position adjacent the outer edge of the platen to a position adjacent the inner edge of the platen including a pivotally mounted guideway, a bar slidably mounted in the guideway, means for reciprocating the bar in the guideway comprising a crank and a connecting rod pivotally secured to the crank and to the bar, the crank and connecting rod being arranged such that the center of rotation of the crank and the centers of the two pivotal connections of the lever are aligned in the extreme positions of the suckers, and means for oscillating the guideway.

4. In a platen printing press of the type described, a sheet-feeding mechanism comprising in combination suckers for picking up a sheet and delivering it to the platen of the printing press, and means for reciprocating the suckers from a position adjacent the outer edge of the platen to a position adjacent the inner edge of the platen including a pivotally mounted guideway, a bar slidably mounted in the guideway, means for reciprocating the bar in the guideway comprising a crank and a connecting rod pivotally secured to the crank and to the bar, the crank and the connecting rod being arranged such that the center of rotation of the crank and the centers of the two pivotal connections of the lever are aligned in the extreme positions of the suckers, and means for oscillating the guideway including a cam and cam follower.

FRANK SYDNEY THOMPSON.