Dec. 6, 1938. J. T. HALE 2,139,228

SHEET FEEDING MECHANISM

Filed June 9, 1937 4 Sheets-Sheet 1

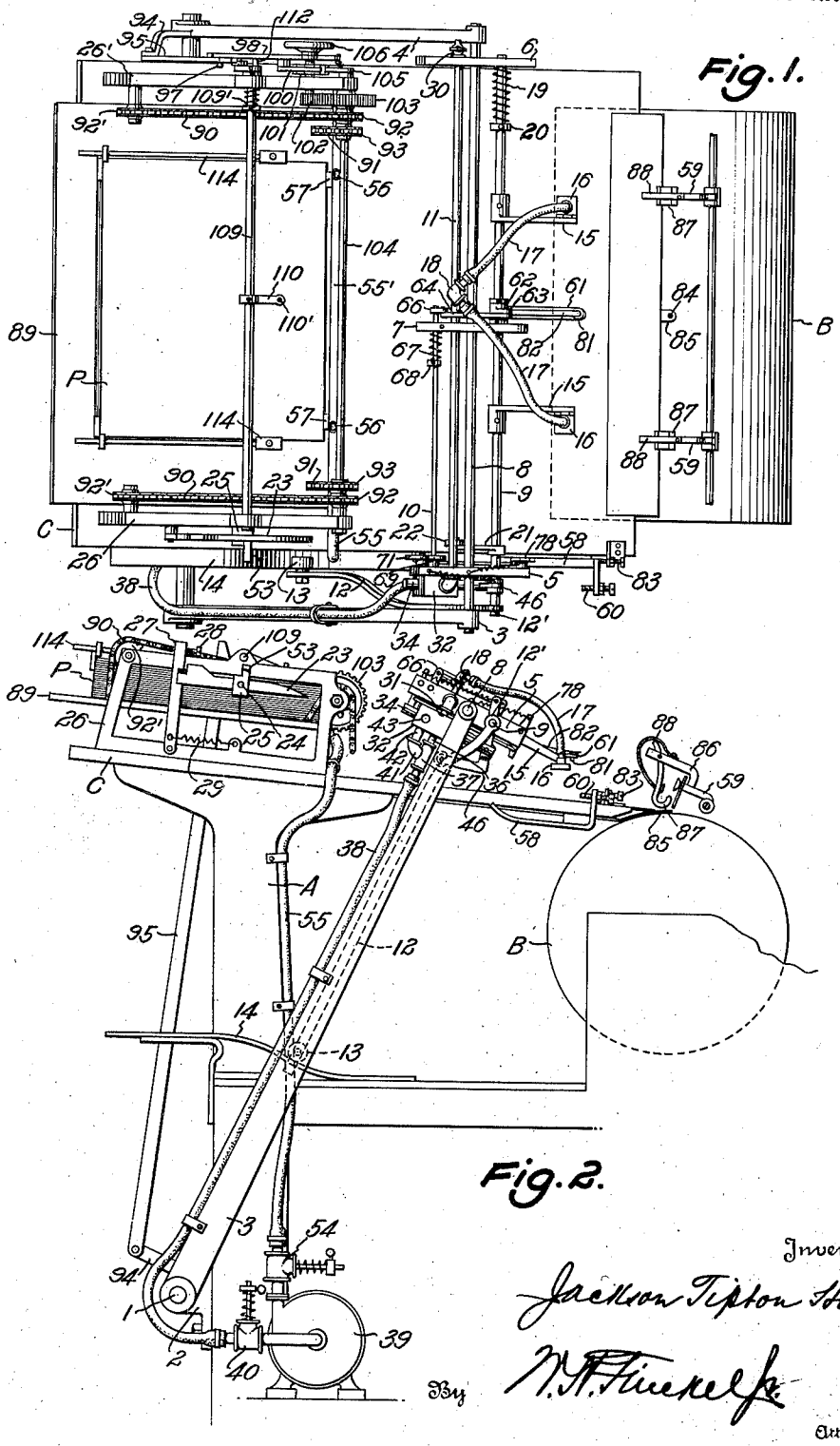

Fig. 1.

Fig. 2.

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SHEET FEEDING MECHANISM

Filed June 9, 1937 4 Sheets-Sheet 2

Fig. 3a.

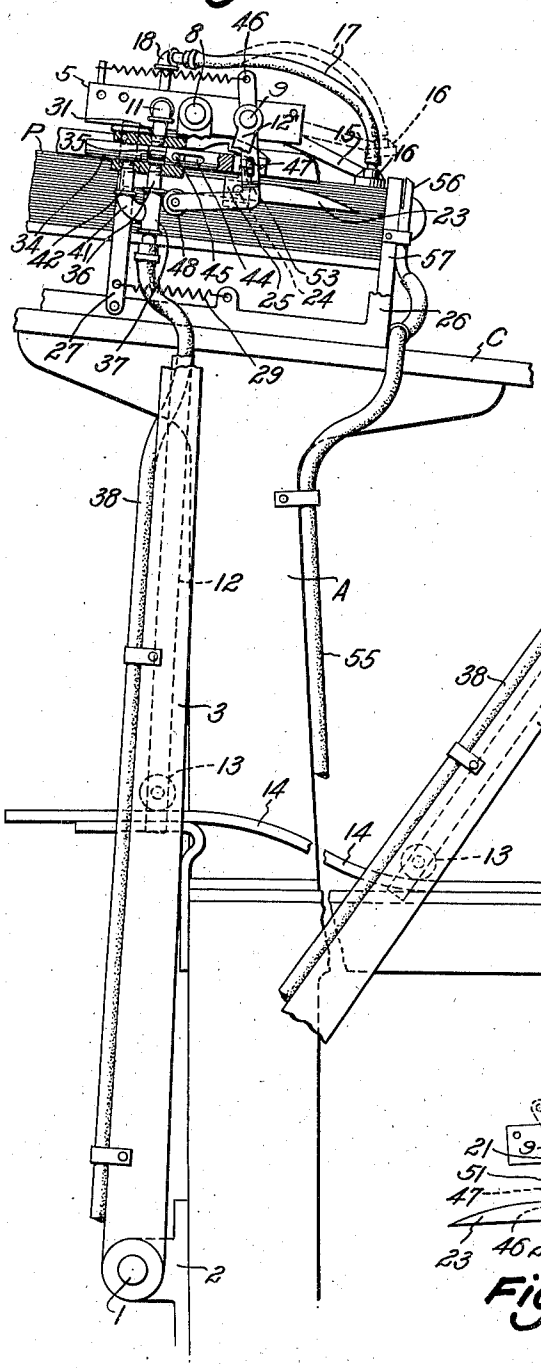

Fig. 4.

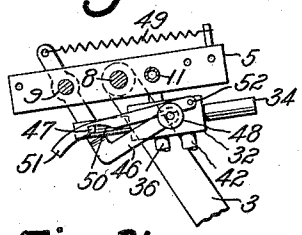

Fig. 3b.

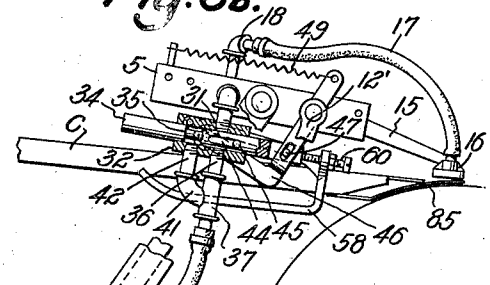

Fig. 5.

Fig. 6.

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SHEET FEEDING MECHANISM

Filed June 9, 1937 4 Sheets-Sheet 3

Fig. 7a.

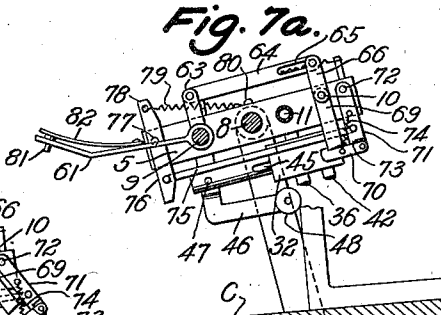


Fig. 7b.

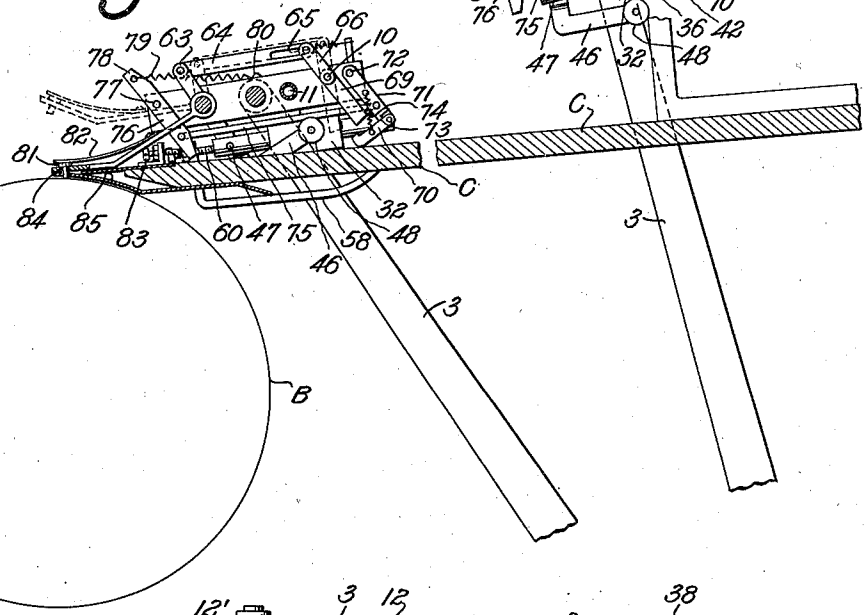
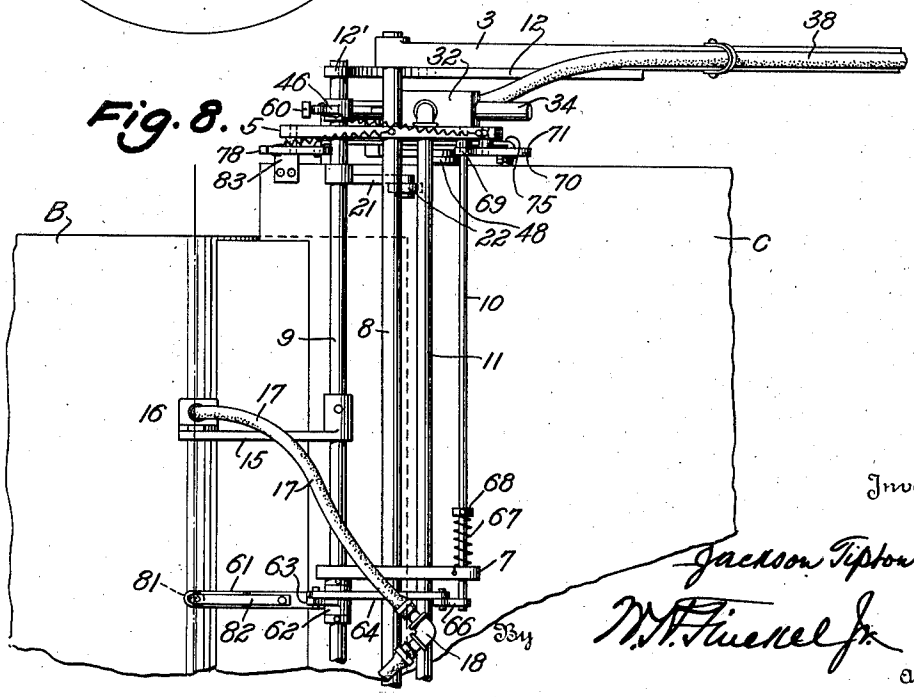


Fig. 8.



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Dec. 6, 1938. J. T. HALE 2,139,228

SHEET FEEDING MECHANISM

Filed June 9, 1937 4 Sheets-Sheet 4

Fig. 9.

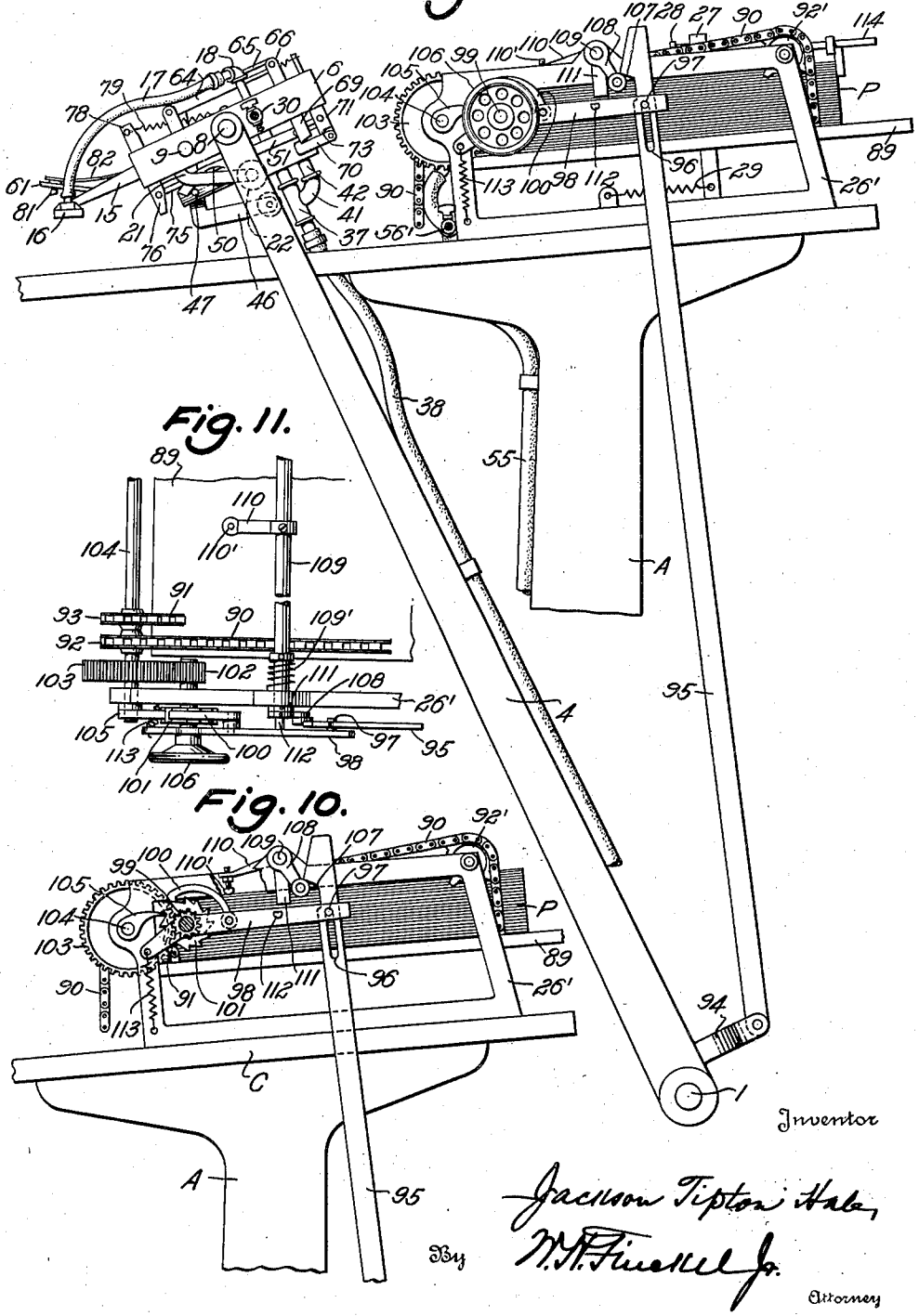

Fig. 11.

Fig. 10.

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Patented Dec. 6, 1938 2,139,228

UNITED STATES PATENT OFFICE

2,139,228

SHEET FEEDING MECHANISM

Jackson Tipton Hale, Atlanta, Ga., assignor, by direct and mesne assignments, to Automatic Press Appliance Company, Fulton County, Ga., a corporation

Application June 9, 1937, Serial No. 147,359

16 Claims. (Cl. 101—287)

This invention relates to sheet feeding mechanism, and particularly to mechanism for feeding sheets from a pile to a printing press or kindred machine, especially a flat bed cylinder press.

One object of the invention is to enable increased speed of feeding to be obtained in a cylinder press of hand fed type, by providing an automatic feeding mechanism, preferably of a reciprocating or oscillating nature, to be attached to the press as an appliance, thereby converting the hand fed press into an automatically fed press.

Another object of the invention is to reduce complexity, and minimize wear of parts and necessary adjustments in a feeding machine of reciprocating or oscillating type.

A further object is to obviate the need for separate sheet-separating mechanism in a sheet feeding machine of reciprocating or oscillating type; the sheet carrying or transferring device of the invention serving also as a sheet separator.

A still further object is to provide simplicity and certainty of operation, furnish exceptionally easy access to the press parts without removing the feeding mechanism, and make possible easy and simple attachment of an automatic feeding mechanism to a normally hand fed cylinder press, whereby the automatic mechanism may be removable and reattachable at will, so that such a press may be fed either automatically or by hand as desired.

Still another object of the invention is to provide means for successively advancing sheets from the pile to the press guides, in which suction is depended upon to enable the means to lift and forward the sheets; the suction being so controlled as to permit gradual reduction of its effect as the point of delivery is approached to thereby produce a delicate delivery of the sheets to the guides.

A still further object is to provide automatic mechanism for insuring proper and accurate contact of fed sheets with the press guides at the time of their release by the sheet-advancing means, and serving, also, as a means for tripping the press-operating mechanism, and hence stopping operation of the press, in the absence of a fed sheet. Also to provide means for positively retaining the fed sheets in engagement with the guides pending their removal by the cylinder.

Another object is to provide means for automatically elevating the pile as sheets are fed therefrom, whereby the top of the pile is maintained at a substantially constant height; the elevating means being operated in response to movement of the sheet-forwarding means.

Other objects and advantages of the invention will appear from the following description.

This sheet feeding mechanism is such that many mechanical parts heretofore deemed necessary in a feeding machine are eliminated, thus permitting the pile of sheets to be brought much nearer to the press than is possible in automatic feeders now known. Hence, the length of the path traversed by a sheet from the pile to the press guides is greatly reduced, making possible a much slower travel of the fed sheets.

The reciprocating or oscillating mechanism operates automatically with the cylinder of the press, and is timed to the revolution of the cylinder, thus being adapted to make one forward or feeding movement and one backward or return movement with each press impression. Suction feet forming a part of the sheet forwarding means and hence of the reciprocating or oscillating mechanism, contact with the top of the pile at the limit of the backward stroke and immediately lift slightly, holding the top sheet by suction, before starting the forward journey to carry the sheet to the press guides. After starting forward from the position described the suction feet dip downward and level off, gradually coming to a stop as the sheet is deposited at the press guides and is released by the suction feet due to the suction being gradually reduced as hereinbefore mentioned. At this juncture, and immediately before the sheet is caught by the gripping mechanism of the press, to be carried thereby onto the cylinder, a small forwardly projecting appliance, hereinafter referred to as a wiper blade, contacts the top of the forward end or edge of the sheet and pushes slightly forward, thereby insuring accurate contact of the sheet with the press guides, as hereinbefore indicated, and suitably mounted on or near the press guides is the simple sheet locking device mentioned, so arranged singly or plurally that the sheet can readily move forward underneath such device but any backward motion of the sheet will be prevented or retarded. After a sheet is carried from the pile to the press guides, as stated, the reciprocating mechanism immediately returns by its backward stroke to pick up another sheet and repeat the operation with each press impression, all as will be explained hereinafter more fully and finally claimed.

In the accompanying drawings illustrating the invention, in the several figures of which like

parts are similarly designated, Figure 1 is a top plan view of the sheet feeding mechanism of the invention with such parts of a flat bed cylinder press shown as are considered necessary to a proper understanding of the invention.

Fig. 2 is a side elevation of the mechanism as illustrated in Fig. 1.

Figs. 3*a* and 3*b* illustrate, in enlarged fragmentary section and elevation, two positions of the feeder head of the mechanism.

Fig. 4 is a fragmentary detail view, in sectional elevation, showing the opposite side of the slide valve mechanism of the feeder head in the position illustrated in Fig. 3*b*.

Fig. 5 is a view similar to Fig. 4 but showing the slide valve mechanism in the position illustrated in Fig. 3*a*.

Fig. 6 is an enlarged longitudinal sectional plan view of the slide valve mechanism.

Figs. 7*a* and 7*b* illustrate, in enlarged sectional side elevation, two positions of the feeder head and the associated wiper mechanism.

Fig. 8 is an enlarged fragmentary plan view showing the parts of the mechanism in the positions illustrated in Fig. 7*b*.

Fig. 9 is an enlarged fragmentary side elevation of the feeder mechanism viewed from the opposite side from that of Fig. 2.

Fig. 10 is a view similar, in part, to Fig. 9, but with parts removed to disclose additional elements of the pile elevating mechanism, and

Fig. 11 is an enlarged fragmentary plan view of parts of the pile elevating mechanism illustrated in Figs. 9 and 10.

The frame A, cylinder B and feed board C are shown in conventional or approved form as parts of a flat bed printing press suitable for illustration of the feeding mechanism of the invention, but forming no part thereof, and it will be understood that although the mechanism of the invention is shown in this particular application, and is specially so adapted, it is not thereby limited in its utility in combination with printing presses of other types.

Mounted upon the ends of an oscillatory shaft 1 carried in bearing members 2 attached to the frame A, are arms 3 and 4 extending upwardly above and flanking the feed board C.

Between the upper ends of the oscillatory arms 3 and 4, and oscillatable with respect thereto, as will later appear, is the feeder head, comprising end frame members 5 and 6, and an intermediate frame member 7 arranged approximately centrally of the head and substantially in alignment with the longitudinal axis of the feed board C. These frame members 5, 6 and 7 are rigidly carried by a transverse shaft 8 having bearings in the upper ends of the arms 3 and 4, and in turn furnish supporting bearings for counter-shafts 9 and 10 and a suction pipe 11, hereinafter referred to in more detail.

The shaft 1 may be oscillated by any appropriate means operating in timed relation to the rotation of the press cylinder B, so that one forward or feeding stroke and one backward or return stroke will be imparted to the arms 3 and 4 and the feeder head carried thereby to each press impression.

Mounted in suitable slide bearings on the arm 3 is a push rod 12 having its upper end 12' connected with an extension of the shaft 9, and carrying at its lower end a roller 13 cooperating with a cam track 14 fixed on the frame A. Thus, as the arms 3 and 4 move forward and backward, the feeder head carried by them upon the shaft 8 will be oscillated upon the axis of the shaft 8 as the roller 13, in following the contour of the cam track 14, reciprocates the push rod 12. This oscillation of the feeder head upon the axis of the shaft 8 serves to establish the travelling level, or elevation, at which sheets are fed from the pile to the press cylinder B, as will hereinafter appear.

Carried by and movable with the shaft 9, and adjustable thereon in spaced relation suitable to the size of sheets to be fed, are arms 15 carrying suction feet 16 of any approved type, to which are connected flexible tubes 17 communicating with the suction pipe 11 through a manifold 18. The shaft 9 is provided with a spring 19 fastened at one end to a collar 20 fixed to the shaft, and at its other end to the frame member 6, and this spring imparts such turning movement to the shaft 9 as normally to hold the suction feet in elevated position. Also mounted on the shaft 9 for movement therewith is a lever 21 carrying a roller 22 arranged for cooperation with a cam member 23 pivoted at 24 in a bracket 25 attached to a frame member 26 of the feeder frame, the cam member 23 having one end normally engaged with a latch member 27 carrying an adjustable stop screw 28 and actuated for engagement with the end of the cam member 23 by a spring 29. By this arrangement, it will be seen that as the feeder head approaches the limit of its backward movement, the roller 22 will ride upwardly upon the cam surfaces of the member 23 and in so doing will oscillate the shaft 9, thus depressing the suction feet into position of contact with the top sheet of the pile P in the feeder frame, and that when the roller 22 contacts with and moves the stop screw 28 and with it the latch member 27, the latch member will be disengaged from the end of the cam member 23 and will permit the adjacent end of the latter to drop under the pressure of the roller 22 imparted by the spring 19, and will permit the suction feet to again be elevated. These two positions of the suction feet, as imparted thereto by cooperation of the roller 22 with the cam member 23 are indicated in Figs. 3*a* and 5. Obviously, when the feeder head moves forward again the cam member 23 will return to position in latched engagement with member 27.

One end of the suction pipe 11 is provided with a pet cock 30 by which the suction effect at the feet 16 may, to some extent, be controlled, and its opposite end is connected at 31 with a slide valve including a block or casing 32 having a bore 33 and a slide or plunger 34, which latter is formed with an annular groove 35. Where the pipe 11 connects, at 31, with the bore 33, there is, in axial alignment with the pipe 11, and also communicating with the bore, a pipe 36 which, through a T connection 37 communicates with a flexible tube 38 leading to the intake side of an air pump 39, a spring loaded pressure control valve 40 being interposed in the connection. The branch 41 of the T is connected through a pipe 42 with the bore 33 at such a distance from the axial line of the pipes 9 and 36 as may be determined by the limits of sliding movement of the plunger or slide 34. Communicating with the bore 33 in line with the pipe 42 is an opening 43 to atmosphere. Reciprocating movement of the plunger or slide 34 may be appropriately limited by any suitable means such as a slot 44 and pin 45. By this arrangement it will be seen that at the limits of its sliding movement, the plunger or slide 34 will, by virtue of

its annular groove 35 establish communication, respectively, between the pipe 11 and the pump 39 and between atmosphere and the pump 39 through opening 43.

Pivoted on the shaft 9 is a bell crank lever 46 attached to the slide or plunger 34 by a pin 47, and having at one end a roller 48, its other end being connected by a spring 49 with the frame member 5. An extension of the pin 47 is engaged by the notch 50 of a trigger 51 pivoted at 52 on the valve casing 32, whereby the slide is normally retained in such position as to establish communication between atmosphere and the pump 39, as shown particularly in Fig. 3b. During backward travel of the feeder head the trigger 51 will engage a trip member 53 carried by the feeder frame 26 and will be raised thereby, as indicated in Fig. 3a, to such position that its notch 50 will be disengaged from pin 47, thus permitting spring 49 to quickly move the plunger or slide 34 into position to establish communication between suction pipe 11 and pump 39.

It will be noted, particularly by reference to Fig. 3a, that at approximately the moment when the valve is tripped to establish communication between the suction pipe 11 and the pump 39, the mechanism including the roller 22 and cam member 23 will cooperate to lower the suction feet 16 into contact with the uppermost sheet of the pile P. Hence, when the suction feet are, thereafter, immediately elevated to the dotted line position, (Fig. 3a) suction will be in operation to elevate with them the topmost sheet of the pile, and while thus elevated, the feeder head will have begun its forward or feeding stroke.

Connected with the exhaust side of the pump 39, through an interposed spring loaded pressure control valve 54 is a flexible tube 55 leading to a blast pipe 55' to which may be connected any desired number of blast nozzles 56 (see Figs. 1, and 3a) preferably arranged adjacent to and supported by the front guides or stops 57 of the pile P. When the slide or plunger 34 is in position to establish communication between the atmosphere and the pump, (see Fig. 3b) these blast nozzles function to project a blast of air against the forward edge of the pile P, thus serving to separate the sheets. A pet cock 56' (see Fig. 9) on the end of blast pipe 55' serves to vent the pipe to atmosphere. Although there may always be some air emitted from the nozzles 56, even when the suction feet 16 are operating upon the sheets being fed, the emission at this latter time is, however, only sufficient to keep the sheets in a condition of separation previously established by the strong blast of air furnished in the manner just described, and the blast may thus be considered as cut off. The effect of suction and air blast may be regulated by proper adjustment of the pet cocks 30 and 56' and of the spring loaded valves 40 and 54.

It will be apparent, therefore, that the slide valve performs a double function. It not only controls suction at the suction feet 16, but it also controls the sheet separating air blast, thus combining in a single valve, and the single operating mechanism therefor, joint control of means which heretofore have been fitted and controlled separately.

It will be noted, from an inspection of Figs. 3b and 4, that when the feeder head approaches the limit of its forward or feeding stroke, the roller 48 will contact with a cam track 58 and will gradually be moved upwardly from its position as illustrated in Fig. 3a, thus moving the slide or plunger to gradually close communication between the suction pipe 11 and the pump 39, and to thereby moderate the effect of suction upon the fed sheet and permit it to be delicately delivered to the press guides 59 (Figs. 1 and 2). The continued forward motion of the feeder head brings the end of the plunger or slide into contact with an adjustable fixed stop 60 whereby completion of movement of the plunger is effected and communication established between atmosphere and the pump 39, and the blast of air furnished at the nozzles 56, the plunger remaining in this position, and the blast of air hence continuing, during the return or backward stroke of the feeder head.

Referring now particularly to Figs. 7a, 7b and 8, it will be seen that the wiper mechanism includes a wiper blade 61 mounted for pivotal movement upon the shaft 9 by means of a bearing sleeve 62 provided with a lever arm 63 connected by a link 64, slotted at 65, with an operating lever 66 fixed upon the counter-shaft 10. The counter-shaft 10 extends from the intermediate frame member 7 to the frame member 5 of the feeder head, and has its bearings in these members, and a spring 67 attached at one end to a collar 68 on the counter-shaft 10 and at its other end to the frame member 7 tends normally to hold the wiper blade in elevated position, as indicated in dotted lines in Fig. 7b and in full lines in Fig. 7a. Adjacent to the frame member 5, the counter-shaft 10 is provided with a crank arm 69 normally engaged by a trigger 70 (see Fig. 7a) carried at the lower end of a lever 71 pivotally mounted at 72 on the frame 5. The trigger 70 is normally held against a stop 73 on lever 71 and in engagement with the end of the crank arm 69 by means of a spring 74. Pivotally connected with the lever 71 is a connecting rod 75, the forward end of which is attached to the lower end of an operating lever 76 pivoted at 77 on the frame member 5 and having an extension 78 to which is connected one end of a spring 79, having its other end fixed at 80 to the frame member 5. The wiper blade 61 carries a stop pin 81 normally held in position to protrude below the lower surface of the blade 61 by a spring 82.

The operation of the wiper mechanism is as follows: At approximately the forward limit of reciprocation of the feeder head, and at a time when suction feet 16 have or have almost deposited the sheet at the press guides 59, the lower portion of lever 76 contacts a stationary adjustable stop 83. Continued forward movement of the feeder head will cause a relative backward movement of the lower portion of the lever 76 and through connecting rod 75, will transmit this movement to lever 71. In this movement, the lever 71 will carry with it the trigger 70, the said trigger 70 pulling backward the lower end of crank arm 69, thus rocking counter-shaft 10 in a counter-clockwise direction against the tension of spring 67. As this action takes place, the operating lever 66 will be rocked forward allowing the slotted connecting link 64 to lower the wiper blade 61 upon the top of the sheet being fed, and in case the sheet is already snugly contacting the press guides it will hold it there. But in case the sheet has not actually contacted the guides the wiper blade 61 will advance it a short distance into contact with the guides. If there be no sheet present, or if the sheet is far enough back from the guides 59 to allow a small hole 84 in the forward end of metal tongue 85

(Figs. 1 and 7b) to remain uncovered, the spring-tensioned stop pin 81 will drop into the hole 84, in which event any continued forward movement of wiper blade 61 will cause a corresponding forward movement of the metal tongue 85 serving to release a trip mechanism (not shown) of any description commonly used for the purpose of tripping and stopping the press. The lowering of the wiper blade 61 takes place with the feed of each sheet, and when the fed sheet is contacting the guides and the wiper blade is lowered on the sheet it will move along the top of such sheet for a relatively short distance until the trigger 70, due to its turning movement as determined by the stop 73, (see Fig. 7b) disengages the lower end of crank arm 69 allowing the spring 67 to rock shaft 10 in a clockwise direction. The rocking of the shaft 10 will move the crank arm 69 forward and lever 66 backward and the connecting link 64 will lift the wiper blade 61 well above the sheet which is then at the press guides (see dotted lines Fig. 7b). It will be noted that as this latter movement takes place the lever 76 is still in contact with stop 83 and through the connecting rod 75 the lever 71 and trigger 70 are still held in their backward position, but at this time the crank arm 69 is considerably forward. Of course, if the feeder head moves further forward after movement of wiper blade 61 is arrested, the resultant movement of lever 66, prior to disengagement of trigger 70, will be accommodated by slot 65 in link 64. As the feeder head commences its backward travel the spring 79 will exert a pull on lever 76 and the parts 76, 75, 71 and 70 will resume their normal positions with the trigger 70 again engaging the end of the crank arm 69.

Suitably mounted on or near the press guides (see Figs. 1 and 2) are one or more sheet locking devices, each including a stationary support 86 and a pivoted presser foot 87 which serves to guide the sheet to the press guides and hold it firmly in contact with the guides. The presser foot 87 is eccentrically pivoted, so that a sheet can readily move forward underneath it, but any backward motion of such sheet is prevented or retarded due to binding action occasioned by increased pressure of contact. Contact may be insured by use of a spring 88 attached to supporting arm 86 and pulling against the presser foot 87.

Referring now to Figs. 1, 2, 9, 10 and 11, it will be seen that the elevator feed platform 89 of the feeder frame is supported by pairs of sprocket chains 90 and 91, or equivalent means, attached to the feed platform adjacent to its opposite sides and front and rear edges and extending over sprockets 92 and 92', and 93, respectively. Attached to arm 4 at a suitable point is a crank arm 94, to the end of which is pivoted the lower end of a connecting rod 95. Near the upper end of connecting rod 95 a slot 96 is provided to engage a pin 97 on the outer end of bell crank lever 98, pivotally mounted on a counter-shaft 99 having its bearing in feeder frame member 26', and the lever 98 carries a pawl 100 which engages a ratchet 101 fixed upon shaft 99. The shaft 99 also carries a pinion 102 meshing with a gear 103 mounted on a shaft 104 to which are attached the sprockets 92 and 93. Pivotally mounted on an extension of shaft 104 is a stop pawl 105 engaging ratchet 101 as a safety device. Rotation of shaft 104 through the gearing 102, 103 will operate the sprockets 92 and 93 to raise or lower the feed platform 89. A manual method of operating the elevator is provided by hand wheel 106 or equivalent means mounted on the end of counter-shaft 99. On the upper end of connecting rod 95 is provided a cam 107 which serves to impart an oscillating motion to rocker arm 108 rigidly mounted on a shaft 109 which in turn causes a raising and lowering of a crank arm 110 carrying an adjustable pile feeler 110' and normally pressed toward the top of the pile P by a spring 109' reacting between the shaft 109 and the frame member 26'. The elevation of the top of the pile limits the travel of arm 110 which in turn establishes the position of a stop finger 111 fixed upon the outer end of shaft 109 so that its lower end may engage a pin 112 on lever 98. When the pile P is at proper elevation, stop finger 111 is in position to engage pin 112 to prevent lever 98 from being raised, the slot 96 in connecting rod 95 compensating for this lack of motion. When the top of the pile is lowered by use, it permits the pile feeler 110' to lower, thus moving stop finger 111 out of the path of travel of pin 112 and permitting it to move upward under the influence of spring 113 attached to lever 98 to a point where pawl 100 will engage a new tooth on ratchet 101. The downward pull of rod 95 upon the end of lever 98 thus rotates gearing 102, 103 to operate the chain and sprocket devices of the elevating mechanism to bring the top of the pile to a normal position. Adjustable stops 114 establish the position of the pile on the feed platform.

A typical cycle of operation of the sheet feeding mechanism of the invention is substantially as follows: Assume that the press is in operation, and that the shaft 1 has imparted to it an oscillatory movement so timed with relation to the rotation of the cylinder B of the press that, as previously mentioned, the feeder head will make one complete forward or sheet advancing movement, and one complete backward or return movement, to each press impression, and that the feeder head is in an intermediate position, substantially as illustrated in Figs. 1, 2 and 9, and that it is travelling upon its return or backward stroke toward the pile P.

As the feeder head approaches the limit of its backward movement, the roller 22 will ride upwardly upon the pivoted cam member 23 and, coming in contact with the high point thereof, will depress the suction feet 16 into contact with the top sheet of the pile of paper P. As hereinbefore explained, substantially simultaneously with the depression of the suction feet 16, trigger 51 will, by cooperation with the trip member 53 become disengaged from the pin 47, and the slide or plunger 34 of the control valve will be moved to the position indicated in Fig. 3a to thereby establish suction at the suction feet 16. Completion of backward movement of the feeder head will cause the roller 22 to press against the stop screw 28, thereby disengaging the latch member 27 from the adjacent end of the cam member 23, and permitting such adjacent end to drop downwardly about the pivot 24 as the roller 22 influenced by spring 19 presses against it, thereby almost immediately restoring the suction feet 16 to their elevated position, as indicated in dotted lines in Fig. 3a, the suction feet thus serving to raise the topmost sheet of paper of the pile and clear its forward edge of the front guides or stops 57 and their adjacent blast nozzles 56. The feeder head now begins its forward or feeding stroke, carrying with it the sheet of paper held by the suction feet, and as the roller 22 moves

over the cam member 23, the latter will be restored to latched condition as the member 27 is operated by spring 29.

As the feeder head moves forward, the plunger or slide 34 of the valve will remain in the position indicated in Fig. 3a, thus maintaining suction upon the fed sheet. Also, the path of travel of the sheet will be governed by the path of movement of the feeder head, the oscillation of which upon the axis of shaft 8 is determined by cooperation of the roller 13 with the cam track 14. As the suction feet 16, with the sheet of paper adhering to them, approach the press cylinder B, the roller 48 of the bell crank lever 46 will engage the cam track 58, with the result that the slide or plunger 34 of the control valve will gradually be moved to close communication between the pipes 11 and 36, thereby moderating the effect of suction at the suction feet 16 and diminishing the grip of these feet upon the fed sheet of paper, so that the sheet will be delicately deposited at the press guides 59. Continued forward movement of the feeder head will bring the end of the valve slide or plunger 34 into contact with the stop 60, as shown in Fig. 3b, resulting in complete closure of communication between the pipes 11 and 36, thus breaking the suction at the feet 16 and opening communication between atmosphere and the pump 39 to establish the sheet separating air blast at the blast nozzles 56.

As the completion of the forward stroke of the feeder head takes place, the wiper mechanism will come into operation, as hereinbefore explained, to ensure proper contact of the fed sheet with the press guides, or if no sheet is fed, or if the sheet is not sufficiently advanced, to stop the operation of the press by actuation of the trip mechanism controlled by the tongue 85.

The fed sheet, when properly advanced into appropriate contact with the press guides, will be held in this position by the sheet locking means, including the presser feet 87, until the sheet is picked up by the press cylinder.

As soon as the fed sheet is properly released by the suction feet 16 and is in position at the press guides, the feeder head will start its backward or return movement, during the continuation of which the slide valve remains in position to establish blast at the blast nozzles 56, as explained, and the cycle of operations is repeated.

Obviously, as sheets are fed from the pile P, and the height of the pile or the elevation of its topmost sheet diminishes, the pile elevating mechanism will operate as hereinbefore indicated, it being understood that if, when the pile of sheets is exhausted, a new supply is not immediately furnished, the operation of the press will be stopped automatically by cooperation of the pin 81 with the hole 84 in tongue 85, as previously explained.

It will be understood that although the sheet feeding mechanism of the invention is designed, primarily, as an attachment for presses normally of hand fed type, and as such is capable of attachment and removal at will, it may be embodied as a part of the press mechanism as furnished to the user.

Various changes and modifications are considered to be within the spirit of the invention and the scope of the following claims.

What I claim is:

1. In sheet feeding mechanism for printing presses and the like, means for supporting a supply of sheets of paper to be fed to the printing mechanism of the press, and means for successively feeding sheets from said supply to said printing mechanism, including a feeder head mounted for movement between said supply and printing mechanism, said head provided with means for engaging a sheet of paper, and means operable during the entire travel of said head for automatically adjusting said head and with it said engaging means with respect to said supply and said printing mechanism.

2. In sheet feeding mechanism for printing presses and the like, means for supporting a supply of sheets of paper to be fed to the printing mechanism of the press, and means for successively feeding sheets from said supply to said printing mechanism, including a feeder head mounted for movement between said supply and printing mechanism, said head provided with means for engaging a sheet of paper, means operable during the entire travel of said head for automatically adjusting said head and with it said engaging means with respect to said supply and said printing mechanism, and means for automatically adjusting said engaging means with respect to said head when the latter is adjacent to said supply.

3. In sheet feeding mechanism for printing presses and the like, means for supporting a supply of sheets of paper to be fed to the printing mechanism of the press, and means for successively feeding sheets from said supply to said printing mechanism, including a feeder head mounted for movement between said supply and printing mechanism, said head provided with means for engaging a sheet of paper, and means for automatically adjusting said head and with it said engaging means with respect to said supply and said printing mechanism during travel of said head, said adjusting means including a stationarily mounted cam member and a cam follower movable with said head and responsive during such movement to the contour of said cam member.

4. In sheet feeding mechanism for printing presses and the like, means for supporting a supply of sheets of paper to be fed to the printing mechanism of the press, and means for successively feeding sheets from said supply to said printing mechanism, including a feeder head mounted for movement between said supply and printing mechanism, said head provided with a suction device for engaging a sheet of paper, and means for controlling the suction effect at said suction device with relation to the travel of said head, said controlling means including a valve carried by and movable with said head, and provided with a relatively movable part serving to alternately establish and interrupt communication through said valve between said suction device and a source of suction, said relatively movable part operating as defined in response to cooperation with trip means arranged adjacent to said supply and said printing mechanism respectively.

5. In a sheet feeding mechanism for printing presses and the like, means for supporting a supply of sheets of paper to be fed to the printing mechanism of the press, and means for successively feeding sheets from said supply to said printing mechanism, including a feeder head mounted for movement between said supply and printing mechanism, said head provided with a suction device for engaging a sheet of paper, and means for controlling the suction effect at said suction device with relation to the travel of said head, said controlling means including a valve carried by and movable with said head, and pro-

vided with a relatively movable part serving to alternately establish and interrupt communication through said valve between said suction device and a source of suction said movable part being movable in response to cooperation with trip means arranged adjacent to said supply and said printing mechanism respectively, the trip means adjacent to said printing mechanism including means serving to gradually move said movable part to gradually interrupt such communication and thereby moderate the effect of suction at said suction device.

6. In sheet feeding mechanism for printing presses and the like, means for supporting a supply of sheets of paper to be fed to the printing mechanism of the press, and means for successively feeding sheets from said supply to said printing mechanism, including a feeder head mounted for movement between said supply and printing mechanism, said head provided with a suction device for engaging a sheet of paper, and means for controlling the suction effect at said suction device with relation to the travel of said head, said controlling means including a slide valve carried by and movable with said head and serving to alternately establish and interrupt communication between said source of suction and said suction device, means to normally retain the slide of said valve in communication interrupting position, resilient means for moving said slide, and means arranged adjacent to said supply of sheets for tripping said slide-retaining means to permit said slide to move under the influence of said resilient means.

7. In sheet feeding mechanism for printing presses and the like, means for supporting a supply of sheets of paper to be fed to the printing mechanism of the press, and means for successively feeding sheets from said supply to said printing mechanism, including a feeder head mounted for movement between said supply and printing mechanism, said head provided with a suction device for engaging a sheet of paper, and means for controlling the suction effect at said suction device with relation to the travel of said head, said controlling means including a slide valve carried by and movable with said head and serving to alternately establish and interrupt communication between said source of suction and said suction device, means to normally retain the slide of said valve in communication interrupting position, resilient means for moving said slide, means arranged adjacent to said supply of sheets for tripping said slide-retaining means to permit said slide to move under the influence of said resilient means, and means arranged adjacent to said printing mechanism and functioning to restore said retaining means to slide-retaining condition.

8. In sheet feeding mechanism for printing presses and the like, means for supporting a supply of sheets of paper to be fed to the printing mechanism of the press, means serving to direct a blast of air against said supply for the purpose of separating the sheets thereof, means for successively feeding sheets from said supply to said printing mechanism, including a reciprocable suction device, combined air pressure and suction producing means connected with said blast means and suction device, and a valve responsive to movement of said suction device between said supply and said printing mechanism and functioning to alternately establish suction at said suction device and pressure at said blast means.

9. In sheet feeding mechanism for printing presses and the like, means for supporting a supply of sheets of paper to be fed to the printing mechanism of the press, means serving to direct a blast of air against said supply for the purpose of separating the sheets thereof, means for successively feeding sheets from said supply to said printing mechanism, including a reciprocable suction device, combined air pressure and suction producing means connected with said blast means and suction device, and a valve responsive to movement of said suction device between said supply and said printing mechanism and functioning to alternately establish suction at said suction device and pressure at said blast means, said valve having a casing ported for connection between said suction device and said air pressure and suction producing means, and between atmosphere and said air pressure and suction producing means, and a movable part controlling said ports and movable at the limits of movement of said head.

10. In sheet feeding mechanism for printing presses and the like, means for supporting a supply of sheets of paper to be fed to the printing mechanism of the press, and means for successively feeding sheets from said supply to said printing mechanism, including a reciprocable feeder head, sheet feeding means carried by said head and serving to advance sheets from said supply and release them at the press guides, and wiper means carried by said head and functioning to insure contact of fed sheets with said guides after release of the sheets by said feeding means.

11. In sheet feeding mechanism for printing presses and the like, means for supporting a supply of sheets of paper to be fed to the printing mechanism of the press, and means for successively feeding sheets from said supply to said printing mechanism, including a reciprocable feeder head, sheet feeding means carried by said head and serving to advance sheets from said supply and release them at the press guides, wiper means carried by said head and functioning to insure contact of fed sheets with said guides after release of the sheets by said feeding means, and trip means carried by said wiper means and serving by cooperation with the trip mechanism of the press to stop the press in the absence of a fed sheet.

12. In sheet feeding mechanism for printing presses and the like, means for supporting a supply of sheets of paper to be fed to the printing mechanism of the press, and means for successively feeding sheets from said supply to said printing mechanism, including a reciprocable feeder head, sheet feeding means carried by said head and serving to advance sheets from said supply and release them at the press guides, and wiper means carried by said head and functioning to insure contact of fed sheets with said guides after release of the sheets by said feeding means, said wiper means including a pivoted wiper blade, means for normally holding said blade out of contact with the fed sheet, means for actuating said holding means to permit said blade to operatively contact with said sheet, and means for releasing said last-mentioned means to permit said blade to return to position out of contact with said sheet.

13. In sheet feeding mechanism for printing presses and the like, means for supporting a supply of sheets of paper to be fed to the printing mechanism of the press, and means for succes-

sively feeding sheets from said supply to said printing mechanism, including a reciprocable feeder head, sheet feeding means carried by said head and serving to advance sheets from said supply and release them at the press guides, and wiper means carried by said head and functioning to insure contact of the fed sheets with said guides after release of the sheets by said feeding means, said wiper means including a pivoted wiper blade, means for normally holding said wiper blade out of contact with the fed sheet, and comprising link and lever mechanism including a spring operated crank arm and a trigger carrying lever normally interconnected by the trigger for joint movement of a predetermined amount serving to permit movement of said blade into wiping contact with the fed sheet, excess movement serving to release said trigger from said crank arm and thereby permit restoration of said blade to position out of contact with said sheet.

14. In sheet feeding mechanism for printing presses and the like, means for supporting a supply of sheets of paper to be fed to the printing mechanism of the press, and means for successively feeding sheets from said supply to said printing mechanism, including a reciprocable feeder head, sheet feeding means carried by said head and serving to advance sheets from said supply and release them at the press guides, and wiper means carried by said head and functioning to insure contact of fed sheets with said guides after release of the sheets by said feeding means, said wiper means including a pivoted wiper blade, means for normally holding said wiper blade out of contact with the fed sheet, and comprising link and lever mechanism including a spring operated crank arm and a trigger carrying lever normally interconnected by the trigger for joint movement of a predetermined amount serving to permit movement of said blade into wiping contact with the fed sheet, excess movement serving to release said trigger from said crank arm and thereby permit restoration of said blade to position out of contact with said sheet, and means for restoring said trigger to engagement with said crank arm.

15. In sheet feeding mechanism for printing presses and the like, means for supporting a supply of sheets of paper to be fed to the printing mechanism of the press, and means for successively feeding sheets from said supply to said printing mechanism, including a reciprocable feeder head, sheet feeding means carried by said head and serving to advance sheets from said supply and release them at the press guides, and sheet locking means arranged adjacent to said guides and functioning to hold fed sheets in position of contact with said guides, said locking means including a pivoted presser foot of predetermined radial length and capable of movement upon its pivot to permit insertion of a fed sheet between it and the feed board of the press, said presser foot acting to bind upon said sheet in the event of attempted movement of the sheet in reverse of its feeding movement.

16. In a sheet feeding mechanism for printing presses and the like, means for supporting a supply of sheets of paper to be fed to the printing mechanism of the press, and means for successively feeding sheets from said supply to said printing mechanism, including a reciprocable feeder head, sheet feeding means carried by said head and serving to advance sheets from said supply and release them at the press guides, and sheet locking means arranged adjacent to said guides and functioning to hold fed sheets in position of contact with said guides, said locking means including an eccentrically pivoted presser foot capable of movement upon its pivot to permit insertion of a fed sheet between it and the feed board of the press, and resilient means normally tending to hold said presser foot in binding engagement with said sheet to resist attempted movement of the sheet in reverse of its feeding movement.

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