No. 876,987. PATENTED JAN. 21, 1908.

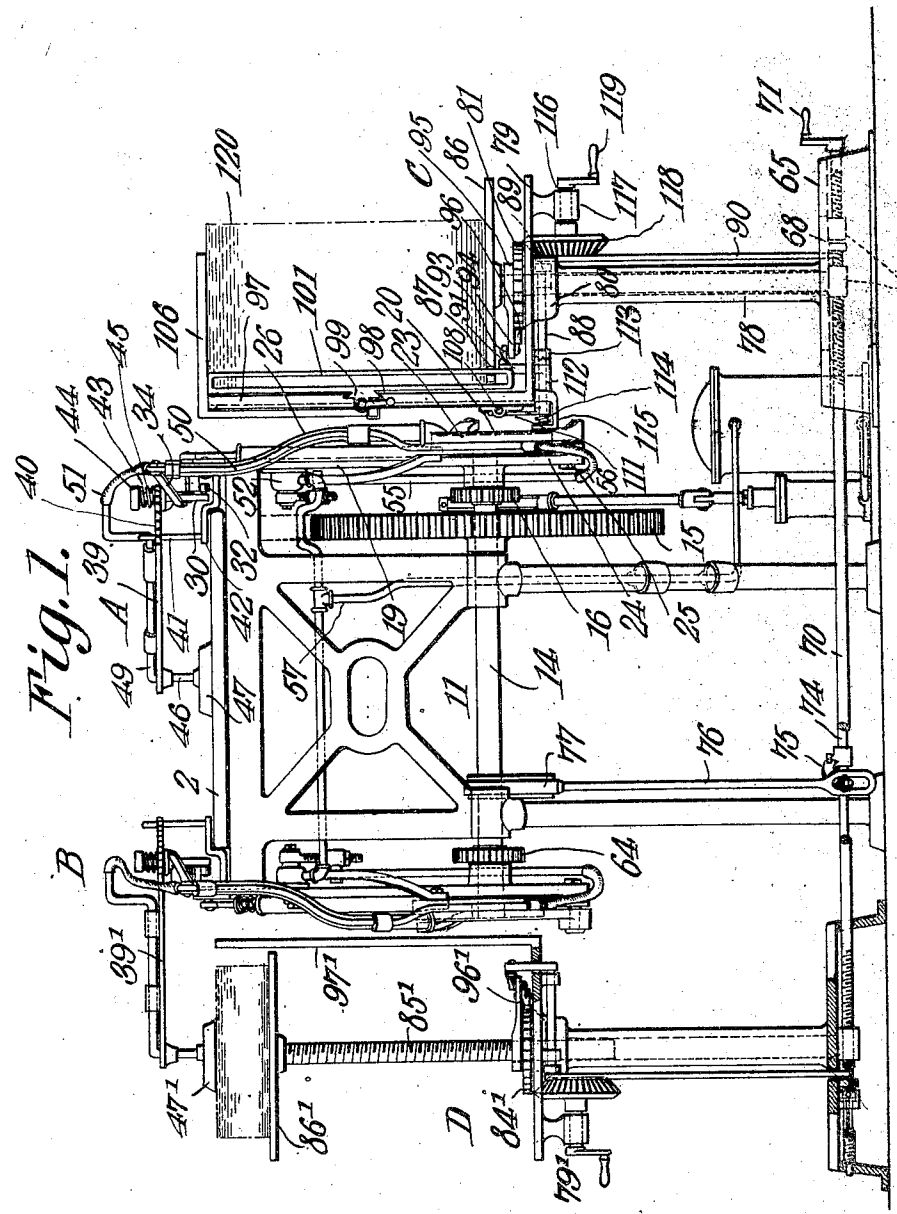
S. MOLINAR.

FEED AND DELIVERY ATTACHMENT FOR PRINTING PRESSES.

APPLICATION FILED DEC. 17, 1906.

4 SHEETS—SHEET 1.

Fig. 1.




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4 SHEETS—SHEET 2

Fig. 2.

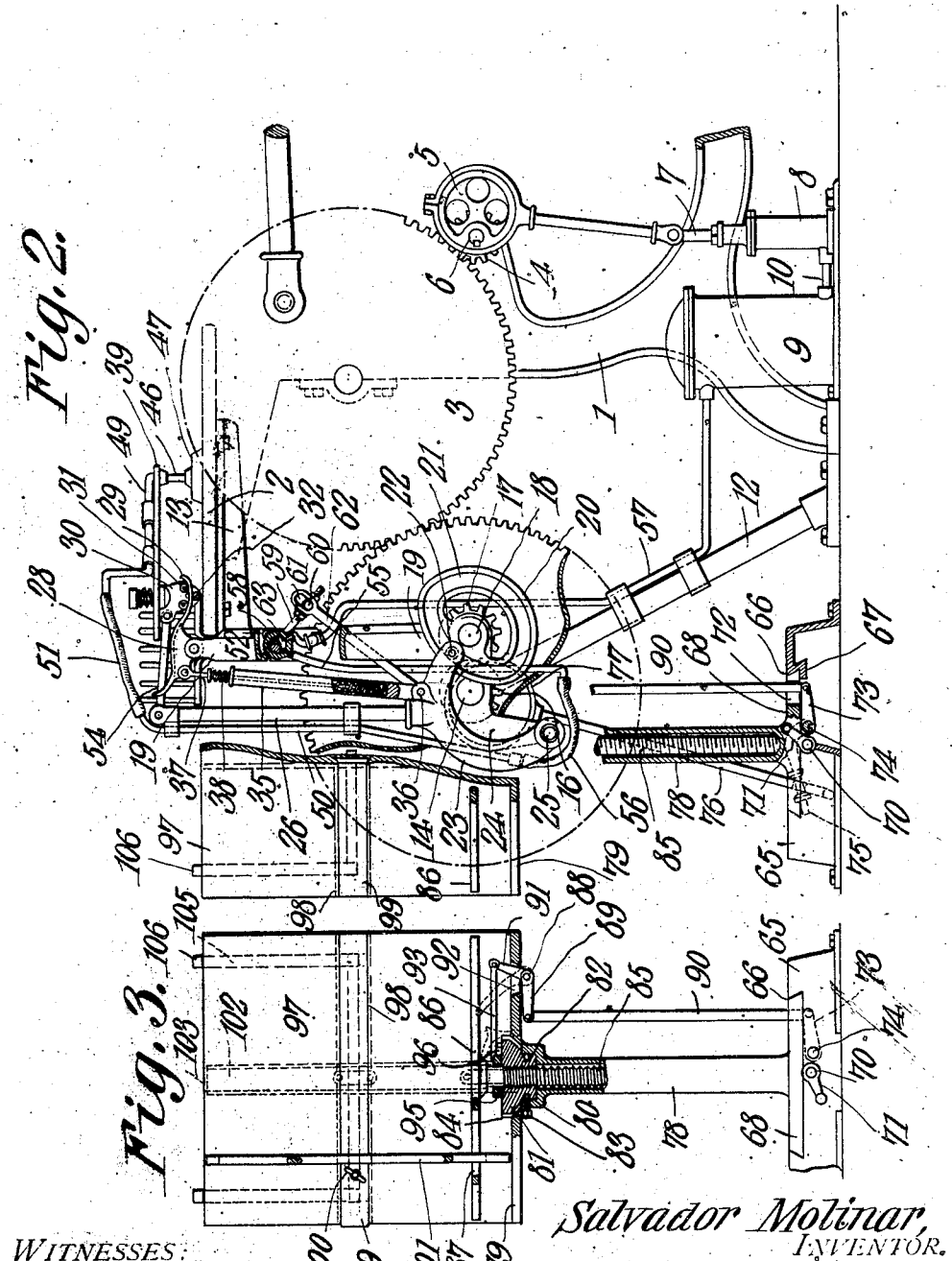


Fig. 3.



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4 SHEETS—SHEET 3.

Fig. 7.

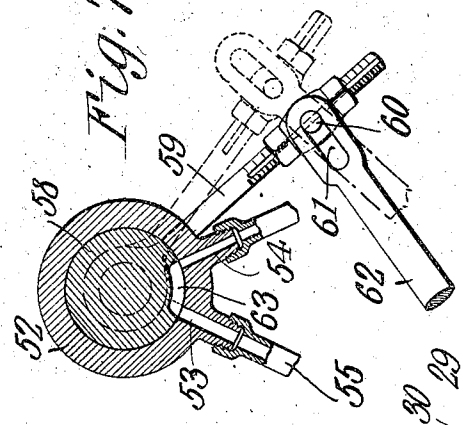






Fig. 4.

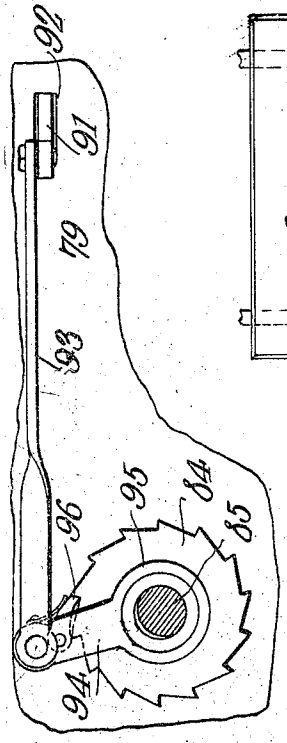



Fig. 9.

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No. 876,987. PATENTED JAN. 21, 1908.

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4 SHEETS—SHEET 4.

Fig. 8.

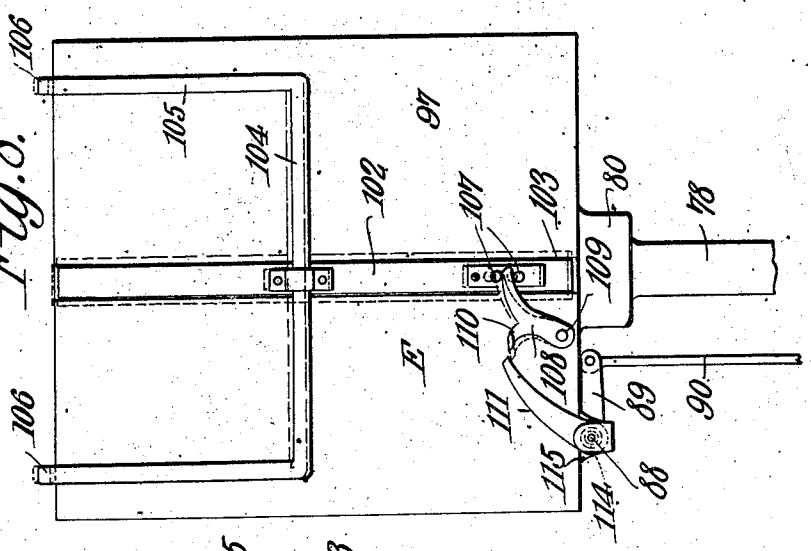



Fig. 5.

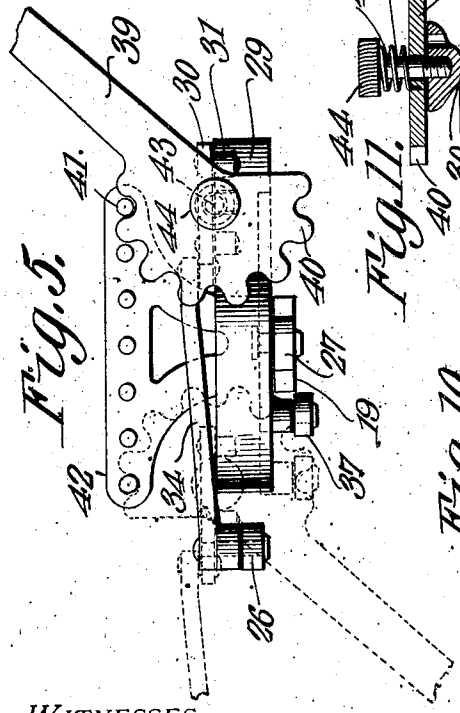



Fig. 11.

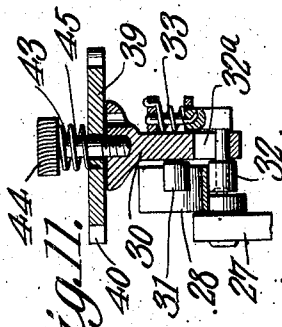
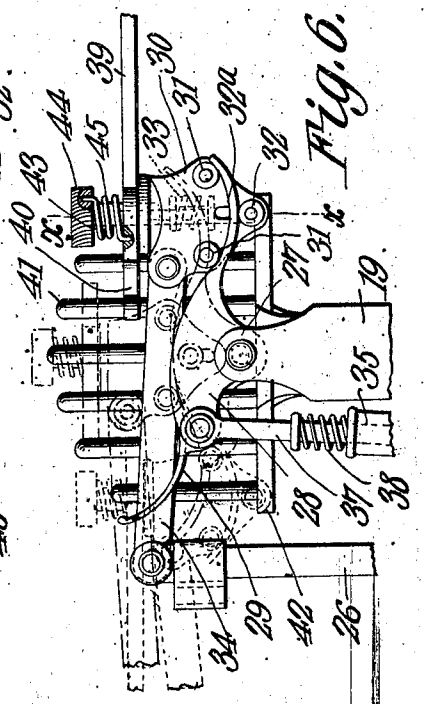



Fig. 10.




Fig. 6.




WITNESSES:

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# UNITED STATES PATENT OFFICE.

SALVADOR MOLINAR, OF CHIHUAHUA, MEXICO.

## FEED AND DELIVERY ATTACHMENT FOR PRINTING-PRESSES.

No. 876,987. Specification of Letters Patent. Patented Jan. 21, 1908.

Application filed December 17, 1906. Serial No. 348,356.

*To all whom it may concern:*

Be it known that I, SALVADOR MOLINAR, a citizen of the Republic of Mexico, residing at Calle 4ª, No. 158, Chihuahua, Mexico, have invented a new and useful Feed and Delivery Attachment for Printing-Presses, of which the following is a specification.

This invention relates to mechanism for feeding paper to, and removing it from, printing presses and it is designed for use in connection with various forms of job presses.

The object of the invention is to utilize suction means for conveying paper from a suitable delivery table and depositing it at a proper point upon a press.

A still further object is to provide similar means for subsequently removing the paper from the press and depositing it upon a receiving table.

Another object is to provide means for controlling the suction within the feed and delivering mechanism so that the same will be established and interrupted at proper intervals during the operation of the machine.

With these and other objects in view the invention consists of certain novel features of construction and combinations of parts which will be hereinafter more fully described and pointed out in the claims.

In the accompanying drawings is shown the preferred form of the invention.

In said drawings: Figure 1 is a front elevation of the improved feeding and delivering mechanism constituting the subject matter of the present invention; Fig. 2 is a side elevation thereof and showing a portion of a press, all but a part of the supply table being removed; Fig. 3 is a side elevation of the supply table, parts thereof being shown in section; Fig. 4 is a plan view of the swinging arms and adjacent parts of the feeding and delivering mechanism, the relative positions thereof and of the supply and receiving tables being shown diagrammatically; Fig. 5 is an enlarged plan view of a portion of one of the arms and its supporting track, one of the positions of the arm and track being disposed in dotted lines; Fig. 6 is a side elevation of the parts shown in Fig. 5 and showing by dotted lines various positions of the arm and its carriages; Fig. 7 is an enlarged section through the valve of the suction apparatus and showing by dotted lines the position assumed thereby when the suction is interrupted; Fig. 8 is a rear elevation of the back of the supply table; Fig. 9 is a plan view of the ratchet mechanism for actuating the supply table; Fig. 10 is a longitudinal section through one of the suction cups; and Fig. 11 is a section on line *x*—*x*, Fig. 6.

Referring to the figures by characters of reference, 1 is a portion of the frame of a printing press the same supporting a feed table 2 and also carrying a large gear 3 which meshes with a small gear 4. This small gear has an eccentric 5 secured to the shaft 6 thereof, said eccentric serving to actuate a pump rod 7 working within a pump cylinder 8. This pump is connected to a tank 9 by means of a pipe 10 and is adapted to withdraw air from the tank so as to create suction.

Secured to the frame 1 in any desired manner is a supplemental frame 11 mounted upon inclined supports 12 and connected to the table 2 in any desired manner as by means of arms 13. The supplemental frame 11 has a main shaft 14 journaled therein and carrying a large drive gear 15 which is of the same size as the gear 3 and meshes therewith. The two gears will therefore rotate at the same speed. A small gear 16 is secured to one end portion of the shaft 14 and meshes with a similar gear 17 secured to a stud shaft 18 journaled within a hanger 19 formed with the supplemental frame 11. An eccentric 20 of the feeding mechanism A rotates with the gear 17 and has a groove 21 in which is adapted to ride a projection 22 carried by one end of a curved yoke 23 pivoted at one end to a hanger 24 as shown at 25. This yoke 23 has an arm 26 rigidly connected thereto and extending upward therefrom and the upper end of this arm projects at all times above the plane occupied by the table 2.

The upper end of the hanger 19 forms an ear 27 to which is pivotally connected a flange 28 depending from one edge of the central portion of a rail 29. As shown particularly in Figs. 2 and 6 this rail has its end portions concave, while its intermediate portion is convex longitudinally and movably mounted on the rail is a carriage consisting of an upstanding plate or body portion 30 having rollers 31 extending laterally therefrom and adapted to bear upon the upper face of the rail, and another roller 32 extending laterally therefrom and adapted to bear upon the lower face of the rail, these rollers being ar-

ranged preferably as shown in Figs. 1 and 6 and the lower roller 37 being movably mounted in a slot 32ª and constantly drawn upward against the rail by means of a spring 33. One end of the body 30 is connected to the upper end of arm 26 by means of a link 34. In view of this arrangement of parts it is obvious that when the yoke 23 is swung upon its pivot 25 by the rotation of eccentric 20 the arm 26 will pull or push upon link 34 and cause the carriage to travel longitudinally along the rail 29. In order that an up and down movement of the carriage may be produced it is necessary to rock the rail 29 at predetermined intervals. This result is obtained by providing the tubular arm 35 which is pivotally connected as at 36 to yoke 23 and has a rod 37 slidably mounted therein and pivotally connected to the flange 28 of the rail 29. A spring 38 is arranged within the arm 35 and constitutes a cushion to gradually stop the movement of the rail when rocked in any direction.

Mounted upon the carriage 30 so as to swing in a horizontal plane is an arm 39 carrying a gear 40 adapted to mesh at all times with a series of pins 41 extending upward from a bracket 42 secured to the hanger 19. A stem 43 constitutes the pivot of arm 39 and has a head 44 in which is secured one end of a coiled spring 45. The other end of the spring, as shown in Fig. 6 is secured to the arm. This spring is adapted to hold the arm 37 normally in position over the table 2 and when the gear 40 and arm 39 are turned upon their pivots the spring 45 will be tensioned and will tend to return the parts to their normal positions. The tubular arm 46 extends downward from the end of arm 39 and carries an inverted cup 47 preferably formed with a plurality of apertures 48 in the bottom face thereof.

A pipe 49 is secured upon arm 39 and connected to the arm 46 and another pipe 50 is secured on the arm 26 and yoke 23 the two pipes being connected by a flexible tube 51. Arranged upon the hanger 19 is a valve casing 52 having an inlet 53 and an outlet 54. The inlet has a pipe 55 extending from it and connected to the pipe 50 by a flexible tube 56 and a pipe 57 extends from the outlet 54 to the tank 9. A plug valve 58 is rotatably mounted within the casing and is provided with a stem 59 having an outstanding pin 60 thereon adapted to work within a slot 61 formed in one end of an arm 62 pivotally connected to the yoke 23. Valve 58 has a passage 63 therein which is adapted when the stem 59 is in one position to place the inlet 53 and the outlet 54 in communication and which when the stem s moved into another position will cut off communication between the inlet and outlet.

The operation of the parts thus far described is as follows: The cup 47 is normally in position upon the table 2 as shown in Figs. 1, 2 and 4. The gear 3 of the press when in operation will rotate the gear 15 and cause the shaft 14 to revolve. Gear 16 will transmit rotary motion to the gear 17 and cause the rotation of eccentric 21. This eccentric will swing the yoke 23 upon its pivot 25 and arm 26 will therefore pull on link 34 and carrier 30 so as to draw it longitudinally along the track 29. At the same time the arm 35 and rod 37 will pull downward on the flange 28 and cause the rail 29 to rock into the positions shown by dotted lines in Fig. 6. A longitudinally up and down movement of the arm 39 is therefore produced and while the carriage is traveling along the rail the gear 40 formed with the arm 39 will travel along the pins 41 and cause the arm 39 to swing laterally as shown by dotted lines in Fig. 4. At the completion of this swinging movement of the arm the carriage 30 will ride on to the lower end of the rail and therefore the cup 47 will be brought downward into the same plane as that originally occupied by it and for the purpose hereinafter set forth. During this swinging movement of the arm 39 the arm 62 will be drawn longitudinally by the yoke 23 and without actuating the valve stem 59 until just prior to the completion of the swinging movement of the yoke 23 and arm 35 whereupon arm 62 will swing the stem 59 so as to establish communication between the valve inlet 53 and outlet 54. A suction will be maintained until just before all of the parts have been returned to their initial positions by the cam 20 whereupon the returning arm 52 will shift the valve back to its initial position and interrupt the suction. It will therefore be seen that the cup 47 upon leaving the table 2 moves upward and forward and then swings laterally to one side of the table and is lowered. At this point during the operation the suction is established through the cup and this suction continues while the movement of the arm is reversed, by the mechanism described. As soon as the cup reaches a position directly above the table 2 during the return movement of said cup the suction is interrupted.

Arranged upon the shaft 14 near its other end is a gear 64 which is adapted to drive delivery mechanism B exactly similar in every respect to the feed mechanism hereinbefore described and in view of the fact that both the delivery and feed mechanism are of the same construction and operate in the same manner it is not deemed necessary to describe said delivery mechanism in detail. It might be stated that the arm 39′ of the delivery mechanism is normally in position with its cup 47′ extended laterally beyond the table 2 and the valve of its suction apparatus is so mounted that the suction is established immediately prior to the move-

ment of the cup 47 on to table 2 and is maintained until just prior to the completion of the lateral movement of the cup beyond the table.

I have devised for use in connection with the herein described feed mechanism a supply table C which is adapted to automatically maintain the top of a stack of paper thereon at a proper level to be contacted by the cup 47 when the same reaches the limit of its outward or lateral movement. As shown in Figs. 1, 2 and 3 this supply table consists of a hollow base 65 having a longitudinal opening 66 in the top thereof adjacent which are located guides 67 on which is mounted a slide 68. This slide has a depending ear 69 which engages one end of a threaded rod 70 extending across the front of the apparatus and having a crank 71 at one end by means of which the rod can be rotated so as to shift the slide 68 longitudinally upon the guides 67. The slide 68 has an aperture 72 therein and extending below this aperture is an arm 73 feathered upon a rock shaft 74 which extends in front of the apparatus and is provided with an arm 75. This arm engages the slotted end of a stem 76 projecting from an eccentric 77 which is mounted on and adapted to be actuated by shaft 14. It is therefore obvious that the rotation of this shaft 14 will produce a rocking movement of shaft 74 and a corresponding oscillating movement of arm 73. As said arm is feathered on the rock shaft it will move with the slide 68 during the adjustment thereof.

A tubular standard 78 is arranged on the slide 68 and supports a stationary table 79 having an enlarged opening 80 at the center thereof in which is rotatably mounted a beveled gear 81. This gear has an annular groove 82 into which projects a retaining device such as a screw 83 and a ratchet 84 is formed with or secured to the gear 81 and extends upward therefrom beyond the upper surface of the table 79. Gear 81 is mounted on and engages a screw stem 85 the upper end of which is swiveled to an adjustable table 86 located above the table 79 and having parallel grooves 87 extending in the front edge thereof. A rock shaft 88 is journaled upon the table 79 and has an arm 89 connected to the arm 73 by means of a rod 90. Another arm 91 extends from the rock shaft 88 and through a slot 92 in the table 79 and is connected by means of a rod 93 with an arm 94 extending from a collar 95 loosely surrounding the upper portion of the stem 85. A spring pressed pawl 96 is pivotally connected to the arm 94 and normally engages the ratchet 84. It is therefore obvious that the rocking movement imparted to the shaft 74 by eccentric 77 will result in the rocking of the shaft 88 and the reciprocation of arm 94 and therefore ratchet 84 will be slowly rotated and will cause the gear 81 to move the threaded stem 85 vertically. Table 86 will therefore be adjusted automatically to a desired elevation. Table 79 has a back 97 extending upward therefrom and provided in its front face with a transversely extending dove-tail groove 98 in which is mounted a slide 99. This slide is adapted to be secured in adjusted position in any preferred manner as by means of a set screw 100 and carries a guide strip 101 which is slotted longitudinally as shown particularly in Fig. 1 so as to project into the slots 87 without interfering with the vertical movement of the upper table 86. This slide and the guide plate extending therefrom constitutes means for holding a stack of paper in an upright position. One edge of each sheet of paper is adapted to contact with the guide 101 and therefore the paper of the stack will be always maintained with its edges in vertical alinement.

The foregoing description of the supply table applies equally as well to a receiving table D located at the other side of the apparatus the only difference being that the ratchet 84′ is adapted to be actuated by the pawl 96′ so as to move the threaded stem 85 carrying the table 86′ downward instead of upward. Moreover, the back 97′ of the table 79′ is not provided with a slide and guide such as shown at 99 and 101.

Should the stack of paper upon the supply table be moved upward too rapidly by the table adjusting mechanism hereinbefore described the top of the stack would be brought in position at too great an elevation to permit the suction cup to properly operate. In order to prevent this undesirable occurrence an automatic stop apparatus E has been devised. This apparatus is located upon the rear face of the back 97 and consists of a slide 102 mounted in a dove-tail groove 103 in the inner face of the back 97 and this slide carries a yoke 104 the upstanding portions 105 of which have fingers 106 extending at right angles therefrom and overlapping the upper edge of the back 97. These fingers are spaced apart a considerable distance so as not to interfere with the proper placing of cup 47. Outstanding lugs 107 are secured upon the slide 102 and projecting between them is one end of a lever 108 fulcrumed upon the back 97, as shown at 109. This lever has a stop finger 110 projecting therefrom and adapted to move into the path of an arm 111 secured to one end of a sleeve 112 loosely mounted on the rock shaft 88. This rock shaft has a clutch member 113 having angular teeth upon one face thereof and these teeth are adapted to engage a similar toothed end of the sleeve 112, said sleeve and clutch member 113 being held normally in engagement by a spring 114. This spring bears at one end against a bracket 115 while its other

end contacts with the end of sleeve 112. The pawl actuating arm 91 hereinbefore referred to extends from the sleeve 112 and the spring 114 holds the clutch members 112 and 113 with sufficient pressure to cause the actuation of the pawl by shaft 88, under normal conditions.

It will be understood that when the shaft 88 is rocked during the actuation of the pawl the arm 111 will be oscillated and as long as the fingers 106 rest upon the upper edge of the back 97 the finger 110 will be disposed out of the path of arm 111, as shown by full lines in Fig. 8. If, however, the stack of paper on the table 86 is fed upward against the fingers 106 so as to slightly raise them finger 110 will be swung into the path of the arm 111 and sleeve 112 will be prevented from rocking. The collar 113 will therefore slip over the clutch face of the sleeve and will continue to rock, although the actuation of the pawl will cease until enough material has been removed from the stack to permit the fingers 106 to return by gravity to their normal positions.

In order that the table 86 may be quickly adjusted vertically without the necessity of employing the pawl and ratchet mechanism described a short shaft 116 is mounted in a hanger 117 on table 79 and carries a beveled gear 118 which meshes with gear 81. A crank 119 is connected to the shaft 116 so as to facilitate the rotation thereof. Similar adjusting mechanism is provided for the table 86′.

As hereinbefore stated the arms 39 and 39′ are normally in the positions shown by full lines in Fig. 4. Before beginning the operation of the apparatus table 86 is lowered as shown in Fig. 1 and table 86′ is raised so as to assume its highest position. When the press is set in motion the table 86 carrying the stack of paper will be gradually raised in the manner hereinbefore described and table 86′ will be gradually lowered. Arms 39 and 39′ will be simultaneously raised, swung and lowered in the manner described, suction being interrupted and established during the initial movement of the respective arms. Cup 47 will be brought into position upon the top sheet of the stack 120 on table 86 and just prior to its contact with said sheet suction will be established through the cup and said sheet will be conveyed thereby during the return movement of cup 47 to a point above the table 2 whereupon the suction will be interrupted and the sheet will be free to drop on table 2. The swinging operation of the arm is then repeated and the printing operation meanwhile occurs. While arm 39 is returning to pick up another sheet from the stack arm 39′ swings into position above the table 2 and just prior to its moving into contact with the sheet thereon a suction is established therethrough in the manner described and the sheet becomes affixed to the cup and is conveyed thereby to the point above the table 86′ whereupon the suction is interrupted and the sheet will fall by gravity on to the said table. As the stack 120 diminishes in size the stack of printed matter on the table 86′ increases and said table is gradually moved downward automatically so that the upper sheet of the printed matter will always be maintained at a predetermined elevation.

The preferred form of the invention has been set forth in the foregoing description but I do not limit myself thereto as I am aware that modifications may be made therein without departing from the spirit or sacrificing the advantages thereof, and I therefore reserve the right to make such changes as fairly fall within the scope of the claims.

What is claimed is:—

1. An attachment for printing presses comprising a table, a pivoted member, means for actuating said member, a conveyer arm movably mounted above the table, a suction cup carried thereby, and separate means secured to and operated by said pivoted member for actuating the arm and for establishing and interrupting suction through the cup.

2. An attachment for printing presses comprising tables, a pivoted member, means for actuating said member, a conveyer movably mounted above the tables, a suction device carried by the conveyer for contacting with an article upon one of the tables, and separate means secured to and actuated by the pivoted member for operating the conveyer and for establishing and interrupting suction through said device.

3. An attachment for printing presses comprising tables, an oscillatory conveyer arm movable between the tables, a suction device carried thereby, a pivoted member, means for actuating said member, and separate means secured to and operated by the pivoted member for actuating the conveyer arm and for establishing and interrupting suction through said device at predetermined points during the movement of the arm.

4. An attachment for printing presses comprising tables, an oscillatory conveyer arm movable thereabove, a suction device carried by said arm, a pivoted member, means for actuating said member, and separate means secured to and operated by the pivoted member for swinging the arm from one table to the other, for raising and lowering the arm during its swinging movement, and for alternately establishing and interrupting suction through the suction device at predetermined points during the movement of the arm.

5. An attachment for printing presses comprising tables, an oscillatory conveyer arm movably mounted above the tables, a suction device carried by said arm, means for creating a suction through said device, a pivoted member, means for operating the same, and separate means secured to and actuated by the pivoted member for oscillating the arm, for interrupting the suction at predetermined points during the oscillation of the arm, and for raising and lowering the arm during its oscillation.

6. An attachment for printing presses comprising tables, a tiltable rail interposed therebetween, a carriage movable longitudinally of the rail, a conveyer arm mounted to oscillate upon the carriage, gripping means carried by the arm, a pivoted member, and separate means operated by said member for shifting the carriage, for tilting the rail, and for oscillating the arm.

7. An attachment for printing presses comprising tables, a tiltable rail interposed therebetween, a carriage movable longitudinally of the rail, an oscillatory conveyer arm mounted upon the carriage, pneumatic gripping means carried by the arm, a pivoted member, and separate means operated by said member for tilting the rail, for actuating the carriage, and for interrupting suction through the gripping means at predetermined points during the movement of the arm.

8. An attachment for printing presses comprising tables, an oscillatory arm mounted to travel thereabove, a suction device carried by the arm and constituting gripping means, means for establishing suction through said device, a cam, a yoke pivotally mounted adjacent thereto and actuated thereby, and separate means operated by the yoke for actuating the arm and for interrupting suction through the gripping device at predetermined points during the movement of the arm.

9. An attachment for printing presses comprising tables, a rail interposed therebetween, a carriage upon the rail, means for actuating the carriage, a conveyer arm pivotally mounted on the carriage, pneumatic gripping means carried by the arm, a gear movable with the arm, and rigid means in the path of the gear for engaging the same to oscillate the arm.

10. An attachment for printing presses comprising tables, a rail interposed therebetween, means for oscillating the rail, a carriage upon the rail, means for actuating the carriage, a conveyer arm pivotally mounted upon the carriage, pneumatic gripping means carried thereby, a toothed device movable with the arm, and rigid means in the path of the teeth for oscillating the arm during the actuation of the carriage.

11. An attachment for printing presses comprising tables, a rail interposed therebetween, means for oscillating the rail, a carriage upon the rail, means for actuating the carriage, a conveyer arm pivotally mounted upon the carriage, pneumatic gripping means carried thereby, a toothed device movable with the arm, rigid means in the path of the teeth for oscillating the arm during the actuation of the carriage, and a tension device for holding the arm normally in a predetermined position.

12. An attachment for printing presses comprising tables, a rail interposed therebetween, a carriage mounted on the rail, a spring controlled conveyer arm pivotally mounted on the carriage, a pneumatic gripping device carried by the arm, means for actuating the carriage, a gear rotatable with the arm, and rigid gear engaging devices in the path thereof for oscillating the arm.

13. An attachment for printing presses comprising tables, a rail interposed therebetween, a carriage mounted on the rail, a spring controlled conveyer arm pivotally mounted on the carriage, a pneumatic gripping device carried by the arm, independent means for simultaneously oscillating the rail and actuating the carriage, a toothed device rotatable with the arm, and rigid means in the path of said device for oscillating the arm during the actuation of the carriage.

14. An attachment for printing presses comprising tables, a rail interposed therebetween, a carriage mounted upon the rail, a conveyer arm pivotally supported upon the carriage, a rotatable eccentric, a pivoted yoke actuated thereby, a connection between the yoke and carriage for actuating said carriage, means operated by the movement of the carriage for oscillating the arm, and a connection between the yoke and rail for oscillating the rail.

15. An attachment for printing presses comprising tables, a carriage mounted therebetween, an arm pivotally mounted on the carriage, means operated by the arm of the carriage for oscillating the arm, a suction device carried by the arm, means for establishing suction through said device, a valve included within said means, a rotatable eccentric, and independent means operated by the eccentric for actuating the carriage and for actuating the valve at predetermined points during the movement of the carriage.

16. An attachment for printing presses comprising a frame, tables rigidly connected thereto, a shaft journaled upon the frame, eccentrics rotatably mounted upon the frame, means actuated by the shaft for rotating the eccentrics, yokes pivotally carried by the frame and actuated by the eccentrics, carriages upon the frame, means operated by the yokes for actuating the carriages, conveyer arms pivotally mounted upon the car-

riages, means operated by the movement of the carriages for oscillating the arms, a suction device carried by each arm, means for establishing suction through said devices, and means operated by the yokes for intermittently interrupting suction through said devices.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

SALVADOR MOLINAR.

Witnesses:

MIGUEL PORRASC,

FERNANDO MENDOZA.