H. B. GREEN.

FEED FOR PRINTING PRESSES.

APPLICATION FILED AUG. 4, 1911. RENEWED JAN. 18, 1913.

1,068,891. Patented July 29, 1913.

2 SHEETS—SHEET 1.

Fig. 1.

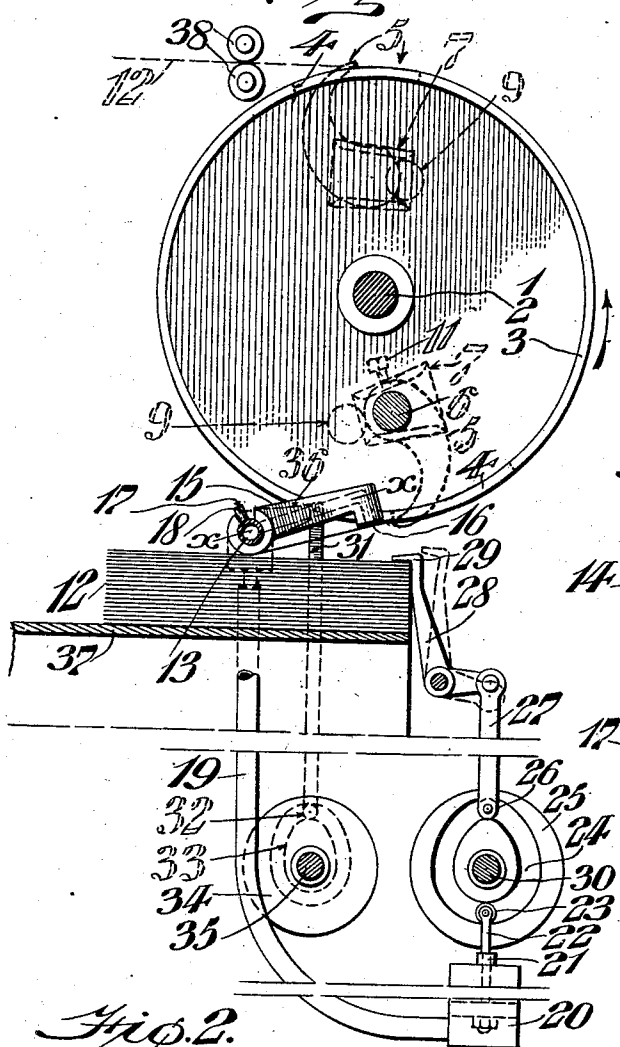


Fig. 3.

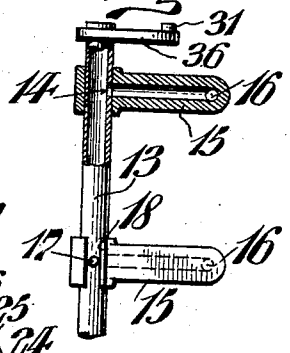
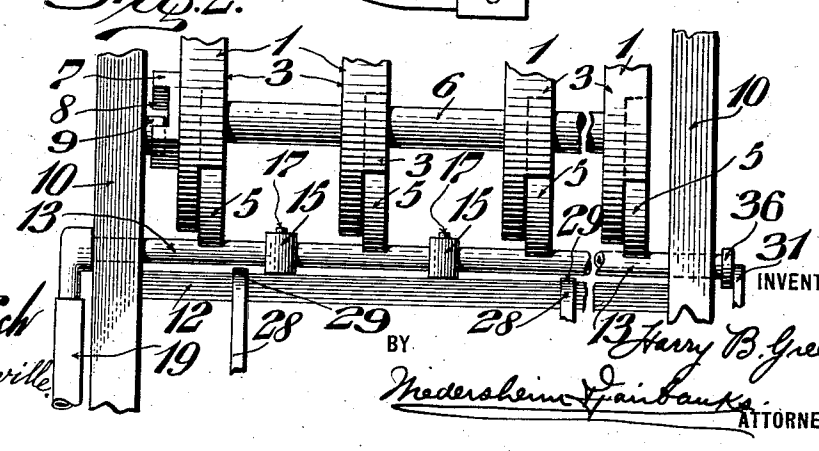


Fig. 2.



WITNESSES

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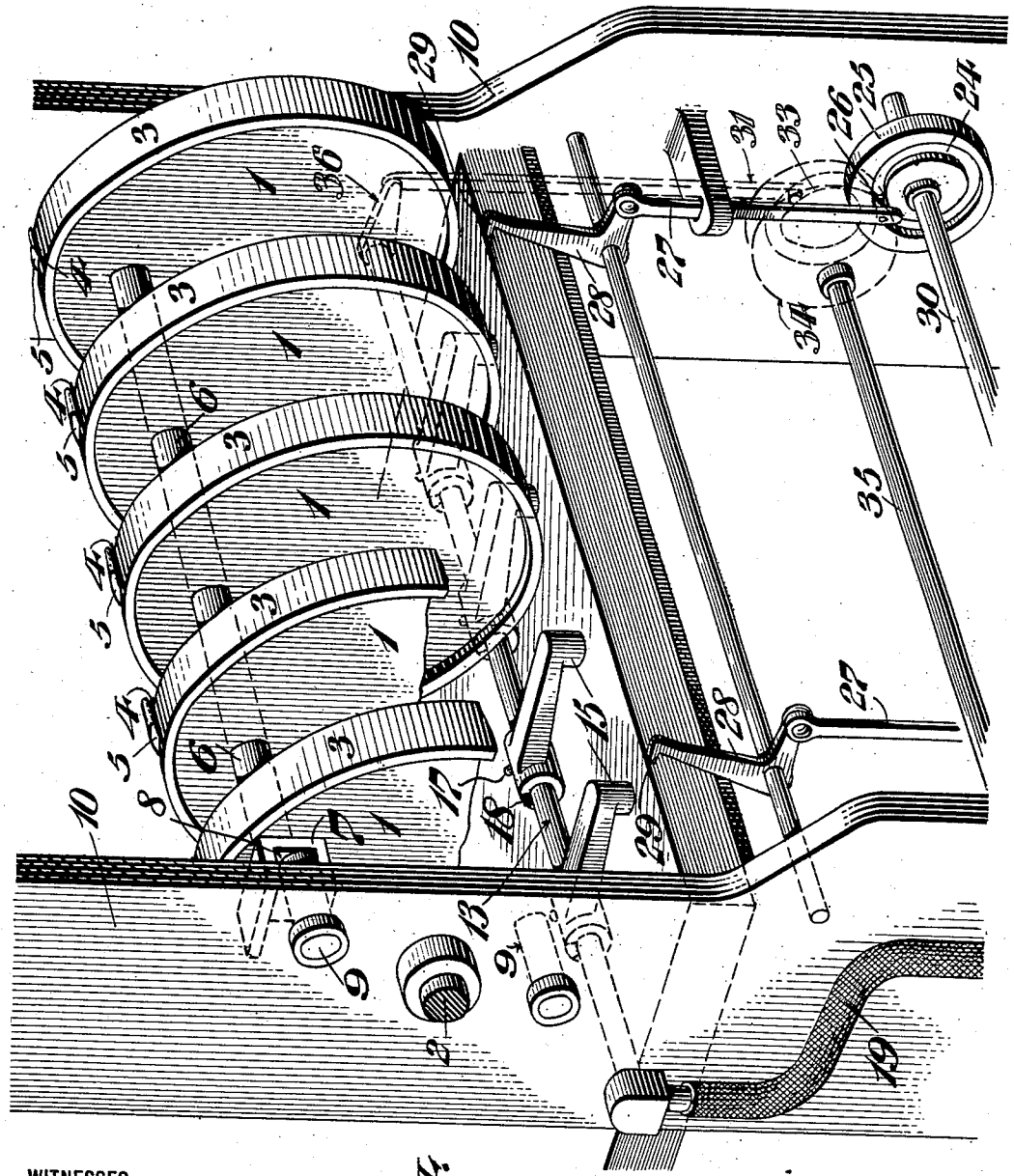

Fig. 4.

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UNITED STATES PATENT OFFICE.

HARRY B. GREEN, OF WOODBURY, NEW JERSEY, ASSIGNOR TO THE SPEED PRESS CO., OF CAMDEN, NEW JERSEY, A CORPORATION OF NEW JERSEY.

FEED FOR PRINTING-PRESSES.

1,068,891. Specification of Letters Patent. Patented July 29, 1913.

Application filed August 4, 1911, Serial No. 642,342. Renewed January 18, 1913. Serial No. 742,978.

To all whom it may concern:

Be it known that I, HARRY B. GREEN, a citizen of the United States, residing at Woodbury, county of Gloucester, State of New Jersey, have invented a new and useful Feed for Printing-Presses, of which the following is a specification.

This invention relates to mechanical feeders for successively feeding sheets of paper and the like to machines of various kinds, and relates more particularly to a pneumatically operated feeding device wherein a suction device is combined with certain novel adjuncts to produce the desired action. In machines of this type which have heretofore been devised it has been proposed to utilize suction as a means for removing a single sheet from a pile of sheets by employing an apertured roller as a suction element and advancing and withdrawing the sheets with respect thereto so that at each operation one sheet would be rolled off and carried to the point of use.

My present invention is different, in so far as I am aware, from anything heretofore devised, in that it comprises a suction element adapted to separate a portion of one sheet from the other sheets and carry the same into operative relation to a feeding machine, by which the entire sheet is removed and substantially simultaneously with the said operation, a separating means is brought into action to prevent displacement of the remaining sheets.

For the purpose of illustrating my invention, I have shown in the accompanying drawings one form thereof which is at present preferred by me, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

Figure 1 represents a side elevation of a portion of a suitable machine, having a feeder embodying my invention attached thereto. Fig. 2 represents an end elevation part broken away of the same. Fig. 3 represents a section on line *x*—*x* Fig. 1. Fig. 4 represents a perspective of the parts shown in Fig. 1.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings:—1 desiguates a feed roll suitably mounted on a shaft 2 and provided, in the present instance, with a laterally extending flange 3 which serves as a guide for the sheet of material. It will of course be understood that there may be any desired number of these rolls 1, depending on the size of the sheet, and I have, in the present instance, disclosed herein an arrangement where a plurality are employed.

The flange 3 of each roll 1 is preferably cut away to form an aperture 4 at a suitable point, for the purpose of permitting the gripping members 5 to pass therethrough into proximity to the sheet of material. These grippers 5 are secured fast to a rock shaft 6 passing through the several rolls 1 and carrying on an end thereof a block 7 fast thereto and having a slot 8 therein, adapted to receive a stud 9. In the present instance, there are two of these studs 9 suitably secured to a fixed portion 10 of the machine, and located respectively adjacent the gripper engaging and releasing positions. The function of these studs 9 is to engage the block 7, shift the latter and rock the shaft 6 at predetermined times and thus alternately actuate the grippers 5 to grip and release a sheet of material. This action is of course produced by the rotation of the rolls 1, which are driven from any suitable source of power, and bring the block 7 successively into engagement with the said studs 9. In order to adjust this block 7 to cause proper movement of the grippers 5, it is adjustably mounted on the shaft 6 by means of a set-screw 11, or an equivalent securing device.

12 designates a stack of superimposed sheets of material carried by any desired type of preferably stationary platform 37, located preferably to bring the ends of the sheets into proximity to the roll 1, so that a suitable separating medium may deliver a single sheet to the grippers 5 at a certain time. This separating mechanism, in the present instance, comprises a hollow rocking, or oscillatory member or spindle 13, suitably secured to the fixed frame 10, and having a plurality of ports 14 therein, spaced apart each of which communicates

with a nozzle 15. These nozzles 15 are preferably mounted for oscillation with the spindle 13 and in normal position present an angularly disposed suction surface 16 in proximity to the sheet stack 12.

17 designates a plurality of pins secured to the spindle 13, each pin in the present instance projecting through a slot 18 formed in each nozzle 15 and serving as a means to move the nozzles from one position to another as the spindle 13 is rocked. It will be noted that the slots 18 are preferably somewhat wider than the pins 17 in order to provide a clearance to permit the several nozzles 15 to adjust themselves for unevenness in the sheets of material.

19 designates a tube perferably of flexible material secured to one end of the hollow spindle 13, the other end of the latter being closed, and by which communication is established with the cylinder 20 of a pumping element 21. It will be understood that any conventional type of suction creating device may be employed and I have therefore deemed it unnecessary to show or describe the same in further detail. The pumping element 21, in the present instance, carries on its piston rod 22, a cam roller 23 adapted to travel in the cam groove 24 of the cam 25. This cam 25 preferably performs a double function since as here shown a second roller 26 seats in the groove 23 and has attached thereto a link 27 which joins and operates a bell crank 28. One end of this bell crank 28 terminates, in the present instance, in a laterally projecting separator finger 29, adapted in one position of the bell crank to project into engagement with the stack of sheets 12, thereby holding and preventing displacement of more than the desired sheet. The cam 25 is mounted for rotation on the shaft 30 which is suitably driven from a main shaft or some other moving part of the machine to which the feeding mechanism is attached.

The nozzles 15 are oscillated, in the present instance, by means of a connecting rod 31 secured to an arm 36, attached to the spindle 13 and carrying at the opposite or lower end, a cam roller 32 adapted to travel in the cam groove 34, the latter being suitably mounted for rotation on the shaft 35. It will of course be understood that this shaft 35 is driven from any suitable source of power. Thus it will be apparent that a reciprocation of the rod 31 will cause rocking of the spindle 13, thereby bringing the pins 17 into engagement with their respective nozzles 15 and will simultaneously move these latter, as already explained. Attention is directed to the relation between the two cams 25 and 34 since the operations controlled thereby, necessitate alternate actuation of the parts, that is to say, when the nozzles 15 are brought into engagement with a sheet of material, the separating fingers 29 are removed, and vice versa. This action will be apparent from Fig. 1 wherein the nozzles are shown withdrawing one sheet of material from the stack 12, while the separating fingers have been brought into engagement with the remaining sheets of the stack and hold the same positively so that no displacement occurs.

In the operation of the device, the sheet stack is first positioned with respect to the feeding elements, and the feed driving means have been thrown into operation, the action is as follows, it being assumed that the parts are in the position shown in Fig. 1:—One sheet of material has been engaged by the grippers 5 and rotation of the roll 1 will withdraw said sheet and carry it on the circumference of the roll to a suitable discharge point, at which time the block 7 engages the release stud 9 causing the shaft 6 to rock and release the gripper 5 so that the sheet may be delivered to the feed rolls 38 of the machine. During this operation the cams 25 and 34 are rotating, the former withdrawing the separator fingers 29 to the position indicated in dotted lines in Fig. 1, and also actuating the pumping element 21 on the exhaust stroke, while the cam 34 brings the nozzles into engagement with the next sheet to be removed. As soon as this position is reached, further movement of the cams 25 and 34 effects a reversal of the operation just described, and the pumping element produces a suction action through the nozzles, causing one sheet to be held against the nozzles and upon the actuation of the latter to be removed from the stack, while the remaining sheets are engaged and retained in close contact with each other by the separating fingers 29, which have now returned to the full line position of Fig. 1. Continued movement of the nozzle adjuncts brings the nozzles 15 to the original position seen in full lines in Fig. 1, with one sheet ready to be engaged by the grippers 5, which it will be understood have completed one revolution and engaged the opposite stud 9 so that they again shift to grip the sheet as previously described.

It will be apparent that as the shafts 2, 30 and 35 may be actuated from any suitable source of power and as the movements of the cams can be properly timed, I have deemed it unnecessary to show and describe the same in detail, and I have also considered it unnecessary to show the entire framework and bearings for the various elements as the construction and operation of the same will be apparent to those skilled in this art.

It will now be apparent that I have devised a complete unitary structure, simple in construction and operation and by means of which a single sheet of material may be

separated and removed from a stack of material in a positive and accurate manner and delivered to a suitable printing press or machine of like character. In so far as I am aware, I am the first in the art to provide a suction means embodying an oscillatory member controlled in a positive manner and actuated at predetermined intervals in the cycle of operations to engage a stationary sheet stack in conjunction with which a separating means is embodied to prevent displacement of more than one sheet of material.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a device of the character stated, a table adapted to support a stack of sheets of material, a member suitably supported above said table, means for rocking said member, a plurality of laterally extending nozzles carried by said member, said nozzles being secured for independent movement relative to said member and adapted in certain positions of said member to move in unison therewith to bring said nozzles into contact with a sheet of material and to elevate the same, a plurality of rolls positioned adjacent said member and operatively located with respect to said nozzles, a gripper carried by each roll adapted to engage said sheet of material, and means for exhausting air from said nozzles.

2. In a device of the character stated, a table adapted to support a stack of sheets of material, a member suitably supported above said table, means for rocking said member, a plurality of laterally extending nozzles carried by said member, said nozzles being adapted to move with said member in certain positions thereof, and each of said nozzles having a limited, free and independent movement relative to said member, a plurality of rolls positioned adjacent said member and operatively located with respect to said nozzles, a gripper carried by each roll adapted to engage a sheet of material, and means for exhausting air from said nozzles.

3. In a device of the character stated, a table adapted to support a stack of sheets of material, a tubular member suitably supported above said table, means for rocking said member, said nozzles being secured for a limited independent movement relative to said member and to be moved in unison therewith, a plurality of rolls positioned adjacent said tubular member and operatively located with respect to said nozzles, a gripper carried by each roll adapted to engage a sheet of material, means for rocking said tubular member to bring said nozzles alternately into proper position with respect to said grippers and into contact with a sheet of material, and means for exhausting air from said nozzles.

4. In a device of the character stated, a plurality of rolls, a gripper carried by each roll adapted to engage a sheet of material, a stationary platform located beneath said rolls and adapted to support said material, a hollow spindle transversely disposed between said rolls and the platform for the material and having a plurality of ports therein, a plurality of laterally extending nozzles carried by said spindle and operatively supported with respect to said grippers, each of said nozzles having communication with one of said ports, means for exhausting air from said nozzles, stops secured to said spindle adapted to limit the movement of said nozzles, a plurality of separator fingers positioned adjacent one end of said platform, and means for operating said fingers to bring said fingers into engagement with said sheet of material, alternately with the movement of said nozzles.

HARRY B. GREEN.

Witnesses:
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F. A. Newton.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."