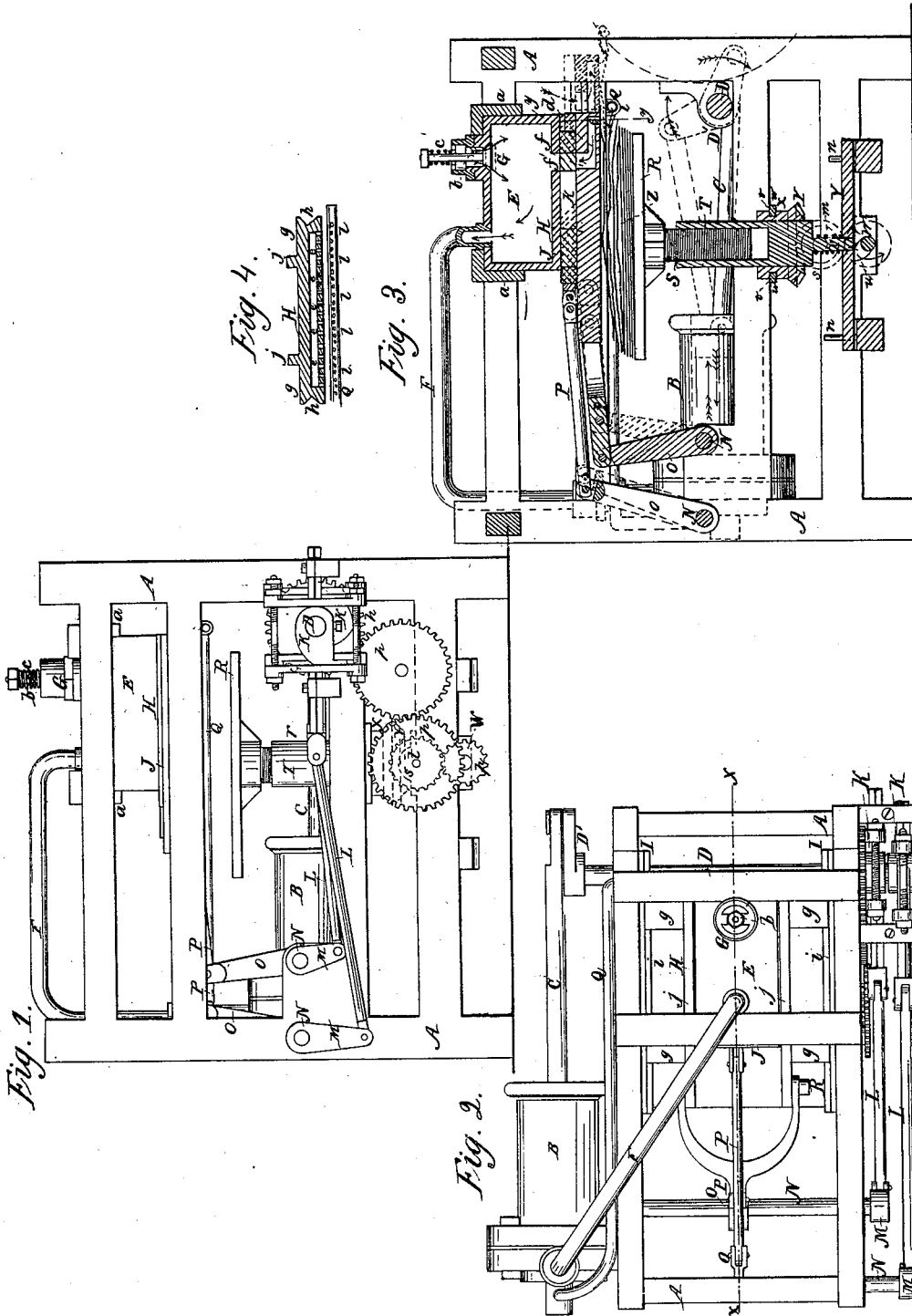


S. I. CHAPMAN.

MACHINE FOR FEEDING PAPER TO PRINTING PRESSES.

No. 14,084.

Patented Jan. 15, 1856.



# UNITED STATES PATENT OFFICE.

SAMUEL I. CHAPMAN, OF CHARLESTON, SOUTH CAROLINA.

MACHINE FOR FEEDING SHEETS OF PAPER TO PRINTING-PRESSES.

Specification of Letters Patent No. 14,084, dated January 15, 1856.

*To all whom it may concern:*

Be it known that I, SAMUEL I. CHAPMAN, of Charleston, in the district of Charleston and State of South Carolina, have invented  
5 a new and Improved Machine for Feeding Sheets of Paper Singly or One at a Time to Printing-Presses; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had  
10 to the annexed drawings, making a part of this specification, in which—

Figure 1, is a side elevation of my improved machine. Fig. 2, is a plan or top view of ditto. Fig. 3, is a longitudinal vertical section of ditto (X) (X) Fig. 2 showing the plane of section. Fig. 4, is a section of the holder or lifter, detached from the machine (y) (y) Fig. 3, shows the plane of section. The inner side of the blast, spout  
20 underneath the holder or lifter is also shown in this view.

Similar letters of reference indicate corresponding parts in the several figures.

The nature of my invention consists, 1st,  
25 in the peculiar means employed which will be hereafter fully described for separating or detaching the uppermost sheet of paper on the feed board from those underneath it, and presenting said sheet properly to the fingers or nippers, or other device by which  
30 it is conveyed to the form on the printing press.

2nd. My invention consists in the peculiar manner of operating the feed board  
35 on which the sheets of paper are filed or placed, so that said sheets are properly presented to the separating and feeding device above mentioned.

3rd. My invention consists in the combination of the separating and feeding device and feed board arranged and operating as  
40 will be hereafter shown and described.

To enable others skilled in the art to make and use my invention I will proceed to describe its construction and operation.

A, represents a rectangular frame constructed in any proper manner, so as to support the working parts of the machine.

B, is an air pump placed at one side of the frame A, the piston head of the air pump is connected by a joint to one end of a rod C, the opposite end of said rod being attached to a crank D' at one end of a shaft D, which is placed transversely at one end  
55 of the frame A, and runs in suitable bearings thereon.

E, is a rectangular box which is fitted within proper guides (a) (a) on the upper part of the frame A, and F, is a pipe which communicates with the upper part of this  
60 box and the suction end of the air pump B. The bottom of the box E, has a slot (f') cut through it as shown in Fig. 3.

G, is a valve in the upper part of the box E. This valve is of the ordinary "puppet"  
65 form and its shank (b) has a spiral spring (c) around it, see Figs. 1 and 3, by which the valve is kept in a closed state except when otherwise acted upon as will be described hereafter. Underneath the box E,  
70 there is a rectangular plate H, see Figs. 3 and 4 which I term a holder or lifter. This plate near its front end is provided with a chamber or recess (d) having holes (e) cut through its bottom near the front end. The  
75 back part of the recess or chamber (d) is cut through to the upper surface of the plate H, forming a slot (f) clearly shown in Fig. 3. The plate H, is provided with arms or  
80 projections (g) two at each side, the ends of which have V-shaped grooves (h) cut in them, see Fig. 4. On the inner sides of the frame A, there are secured guides I, I, see  
85 Fig. 2, having V-shaped projections (i) (i) which fit in the V-shaped grooves (h) in the arms or projections (g) of the plate H. The upper surface of the plate H, is provided with two parallel ledges (j) (j) placed at suitable distances apart, between which a  
90 plate J, is fitted, a suitable space being allowed between the upper surface of the holder or lifter H, and the under surface of the box E, to allow the plate J, to work snugly between them. The plate J, corre-  
95 sponds in width with the box E, and has a slot or opening (k) cut through it, see Fig. 3. This slot or opening extends across nearly the whole width of the plate J, which is in effect a valve as will be hereafter shown.

Both the holder or lifter H, and the valve  
100 J, have a sliding or reciprocating motion given them by means of cams K, K, on one end of the shaft D. These cams by means of rods L, L, and cranks or arms M, M, give a rocking motion to two shafts N, N,  
105 which have arms O, O, upon them to the outer ends of which rods P, P, are attached, said rods being also attached to the ends of the holder or lifter H, and valve J, as clearly shown in Fig. 3.

Q, is a tube one end of which communicates with the suction end of the air pump

B, a valve being between the inner end of this tube and the cylinder of the pump so that a blast may be forced in the tube as the piston is forced inward, and the opposite end passes transversely underneath the front part of the holder on lifter H. The inner side of this part of the tube is perforated with holes (*l*) see Figs. 3 and 4.

R, represents the feed board or table which is directly underneath the holder or lifter H, as shown clearly in Figs. 1 and 3. The feed board is supported by or rests upon a screw rod S, which fits within a socket T, having a female screw in its inner surface. The lower end of the socket T, has a small rod U, attached to it, the lower end of which passes through a plate V, at the lower part of the frame A. The rod U, has a spiral spring (*m*) around it, the lower end of which bears against the plate V, and the upper end against the lower end of the socket T, see Fig. 3. The plate V, is not attached to the frame A, but is allowed to move up and down, the plate working on guide pins (*n*) (*n*) attached to the frame A, see Fig. 3. Underneath the plate V, there is a shaft W, which runs in suitable bearings on the frame A. This shaft is connected by gear wheels (*p*) (*p*) (*p*) (*p*) with the shaft D, as shown in Fig. 1. The socket T, is provided with a feather (*r*) see Fig. 1, which fits in a groove in a collar X. This collar has a bevel wheel Y, at its lower end which gears into a bevel pinion (*s*) on a small shaft (*t*) on which one of the gear wheels (*p*) is hung, see Fig. 1. On the shaft W, there are placed cams (*u*), one or more, see Fig. 3. The collar X, has a groove (*v*) cut in it or around it and a plate (*w*) attached to the frame A, fits around the collar and in the groove (*v*) see Fig. 3.

Operation: The pile or sheets of paper represented by *h*, Fig. 3, to be fed to the press are laid upon the feed board R, and motion is given the shaft D, in any proper manner. As the shaft D, rotates, the air pump B, is operated by means of the crank D', and rod C, and as the piston of the pump is drawn outward a vacuum is produced within the box E, through the pipe F. As the piston of the pump B, is being drawn outward, the valve J, and holder or lifter H, are moved in consequence of the cams K, and their connections previously described, so as to bring the slots (*k*) (*f*) (*f'*) in the box E, valve J, and holder or lifter H, in line with each other and consequently a vacuum is produced in the chamber or recess (*d*) in the holder or lifter H, and just at the time this vacuum is formed in said chamber or recess (*d*) a trifle before, the feed board R, is raised by the cams (*u*) and the uppermost sheet of paper is pressed against the undersurface of the holder or lifter H, and the suction in the holes (*e*)

will hold the front edge of the sheet against the holder or lifter H. The feed board then drops and the piston being forced inward at this point, a blast of air is driven between the uppermost sheet, (the front edge of which is now suspended) and the sheets underneath it, see Fig. 3, which represents the position of the parts at this part of the operation, the holder or lifter moving forward at the same time and properly presenting the front edge of the sheet to the fingers, nippers or other device which conveys it to the printing press or the form thereon. At the time the edge of the sheet is grasped by the fingers or nippers of the printing press the slot (*f*) at the back of the recess (*d*) is exposed to the atmosphere in front of the box E, and the air rushes into the recess (*d*) destroying the vacuum therein and allowing the sheet to be detached from the under surface of the holder or lifter see dotted lines Fig. 3. Before the holder or lifter returns for a succeeding sheet the valve J, is moved forward and closes the shaft (*f*) and the valve and holder or lifter then moves back in order that the slots (*f*) (*f'*) (*k*), may be again brought in line to allow the vacuum to be produced in the chamber or recess (*d*). As soon as the vacuum is produced in the recess (*d*), the holder or lifter H, moves a little forward so as to cut off the communication between the recess (*d*) and the box E.

The valve G, prevents the suction in the box E, and recess (*d*) in the holder or lifter H, from being so strong as to cause the paper to be ruptured. This valve is depressed by the pressure of the atmosphere when the vacuum is too perfect. The spring (*c*) is made of the required strength to effect this purpose.

The feed board R, every time it is raised by the cams (*u*) is made to approach nearer the under surface of the holder or lifter by means of the socket T, which is turned and elevates the feed board on account of the screw rod S, fitting or working within it. By this means the pile or sheets of paper are always pressed snugly against the under surface of the holder or lifter, the feeding upward of the board R, by means of the socket T, and screw rod S, compensating for the diminishing height of the pile of paper.

The variation in thickness of different kinds of paper or other irregularity in feeding upward the board R, is compensated for by the spiral spring (*m*) on the rod U, at the lower part of the socket T. This spring "takes up" if I may so speak the throw of the cams (*u*) and allows me to use cams which would raise the feed board much higher than is required, the cams when the feed board is pressed upward against the under surface of the holder or lifter merely

act against the spring (*m*) or rather press upward the plate V, and compress the spring (*m*) which keeps the feed board snugly against the holder or lifter.

5 I do not claim feeding paper to printing presses by atmospheric pressure irrespective of the construction and arrangement of parts herein shown, for various devices have been patented for that purpose, but what I do  
10 claim as new and desire to secure by Letters Patent, is

1. Separating and detaching the uppermost sheet of paper on the feed board R, from those underneath it, and properly  
15 presenting said sheet to the fingers, nippers, or other device by which it is conveyed to the printing press or to the form thereon, by means of the box E, valve J, and holder or  
20 lifter H, the above parts being constructed and arranged as herein shown and operating in connection with a vacuum produced in the box E, and a blast through the tube Q, the vacuum and blast being produced by an air pump B, or its equivalent.

2. I claim operating the feed board R, by 25 means of the cams (*u*), plate V, spring (*m*) and socket T, and screw rod S, fitting into said socket, as herein shown and described, motion being given the socket by means of a collar X, attached thereto by a feather  
30 (*r*), whereby the feed board is made to rise and fall to convey the sheets to the holder or lifter, and the diminishing height of the pile of paper compensated for, and also any irregularity in the thickness of the  
35 sheets.

3. I claim the feed board R, operated as herein shown, in combination with the valve J, holder or lifter H, and box E, operating in connection with the vacuum produced in  
40 the box E, and the blast in the tube Q, in the manner and for the purpose as herein shown and described.

SAML. I. CHAPMAN.

Witnesses:

O. D. MUNN,  
S. H. WALES.