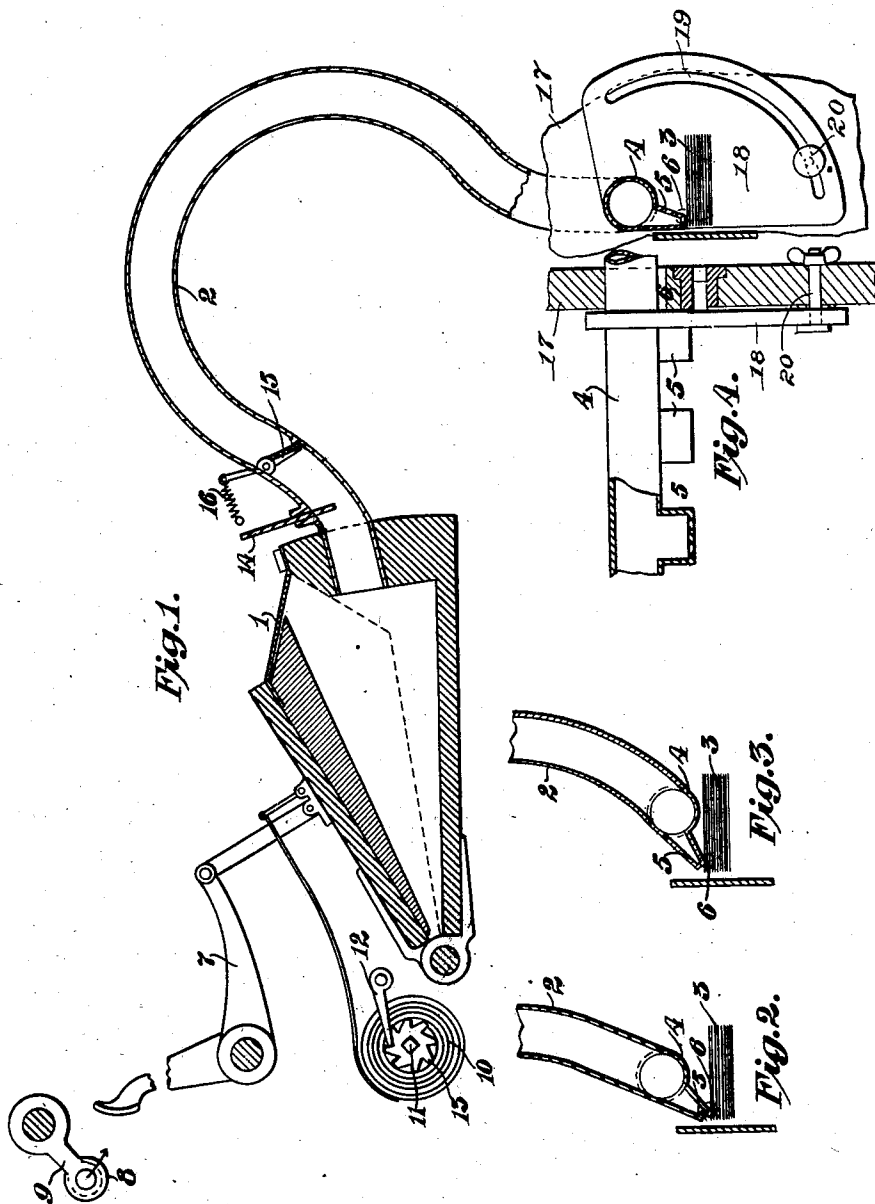


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A. LAGERMAN.  
PNEUMATIC SHEET FEEDER.  
APPLICATION FILED JAN. 31, 1903.

NO MODEL.



Witnesses  
*Conitche*  
Peter H. Ross.

Inventor  
*Alexander Lagerman*  
By his Attorney *Henry Conitche*

# UNITED STATES PATENT OFFICE.

ALEXANDER LAGERMAN, OF JÖNKÖPING, SWEDEN.

## PNEUMATIC SHEET-FEEDER.

SPECIFICATION forming part of Letters Patent No. 758,453, dated April 26, 1904.

Application filed January 31, 1903. Serial No. 141,284. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXANDER LAGERMAN, engineer, a subject of the King of Sweden and Norway, and a resident of Jönköping, in the Kingdom of Sweden, have invented certain new and useful Improvements in Pneumatic Sheet-Feeders, of which the following is a specification, reference being had therein to the accompanying drawings.

For the feeding of the paper a sheet at a time in printing-presses and the like by means of suction a great number of various devices have already been tried without, however, attaining any positive success in the object aimed at—viz., that during suction only the top sheet may rise or be segregated so that it can be seized by the catcher or the like, which has to convey the said sheet still farther, for either several sheets at a time have sometimes followed the suction apparatus or occasionally not a sheet has been raised. By the present invention the advantage is gained that the suction apparatus takes the top sheet of the paper pile with absolute sureness without more than one sheet being taken at a time. This is effected by exposing the top sheet to a powerful suction, which latter can be regulated so that it will be stronger or weaker in accordance with the thickness of the sheet of paper to be taken and by the suction-mouthpiece being set at various angles to the paper. If the sheet be thick—*e. g.*, such as a sheet of pasteboard—the end of the mouthpiece is set so as to come flat against the paper; but if the paper be thin and easily flexed the mouthpiece is set at a more or less acute angle to the same.

In the annexed drawings, Figure 1 shows the device in horizontal section. Fig. 2 shows the mouthpiece at an angle different from that in Fig. 1. Fig. 3 shows the mouthpiece at yet another angle. Fig. 4 is a side view of a portion of the suction apparatus as seen from the right in Fig. 1. Figs. 2 and 3 are intended to show the operation of the mouthpiece.

The device in its entirety must of course be arranged in accordance with the machine, which latter may be a sheet-feeding apparatus for fly-presses, platen-presses, folding-machines, calenders, &c. A bellows 1 com-

municates, by means of a flexible tube 2, with a pipe 4, situated along and immediately above the edge of the paper pile 3 and provided with one or more downwardly-inclined mouthpieces 5. The pipe 4, with its mouthpieces, is mounted to turn about journals 6 in the frame 17, Fig. 4, the pivotal axes of the journals being substantially alined with the margin of the flat face of the mouthpiece which is farthest back from the edge of the sheet of paper 3, and conveniently the said journals may be on plates 18, which carry the pipe 4, the plates having each a curved slot 19, concentric with the journal 6 and engaged by a clamping-bolt 20 in the frame 17. This device enables the mouthpiece to be adjusted so that its face will be disposed parallel with the paper, as in Fig. 1, or at an angle thereto, as in Figs. 2 and 3. The bellows is compressed by means of the bell-crank lever 7, which is acted upon by the arm 9, which latter extends from one of the shafts of the machine and is provided with a roller 8 or the like. The spring 10 draws the movable top part of the bellows upward. This spring is coiled around a shaft 11, which can be turned round by means of a key or the like in order to give the spring a greater or less tension. The pawl 12, which engages the ratchet-wheel 13 of the shaft, serves to maintain the tension of the spring.

The said device may obviously be arranged in various ways, the principal thing being that the tension of the spring can be easily and readily regulated so that the tension is greater when the paper to be fed is thick and less when it is thin.

The suction-power of the device may be regulated by a slide or damper 14 in the tube 2, which slide may be pushed in or drawn out more or less at will to constrict the air-passage, and thus measurably check the rapidity of the exhaust. This is a most important matter, for if the suction be ever so little too strong the suction apparatus will take more than one sheet at a time and if it be too weak the suction apparatus fails to grip. When the roller 8 has passed the lever, (see arrow in Fig. 1,) the bellows is rapidly expanded by the spring 10, in consequence of which a

powerful suction is created at the mouthpieces, so that the top sheet attaches itself to the plane under side of the latter. If the paper is thin, the pipe is turned so that the mouthpiece occupies an inclined position, Figs. 2 or 3. As the under side of the mouthpiece is then not parallel with the upper side of the paper pile, the edge of sheet of paper attaching itself to it is compelled to bend or flex upward. By reason of its stiffness the next sheet underneath does not participate in the said turning up, and in consequence the top sheet is securely separated from the former. For thick pasteboard or the like no bending of the leaf is necessary, and the mouthpiece is then set so that its under side is parallel with the paper, as seen in Fig. 1. By experiment the proper adjustment for every thickness of paper is easily ascertained.

Suitable grippers (not shown) enter between the mouthpieces 5 and seize the turned-up edge of the segregated sheet.

To prevent the air from being forced back through the tube 2 and pipe 4 when the bellows collapse, a spring check-valve is provided. As herein shown, this valve 15 is set in the tube 2 and provided with a spring 16, tending to hold it closed.

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

1. A pneumatic sheet-feeding mechanism having a mouthpiece with a substantially flat face, and said mouthpiece pivotally mounted

with the pivotal axis in the same plane with the said face, whereby the latter may be adjusted on its pivot to an angle with the surface of the sheet to be separated proportional to the stiffness of said sheet.

2. A sheet-feeding mechanism, having an air-exhausting means, means for regulating the force of the exhaust to suit the character of the sheets to be fed, a mouthpiece mounted adjustably so that it may be set with its face at any desired angle with the surface of the sheet to be lifted, and a conduit connecting said mouthpiece with the air-exhausting means.

3. A sheet-feeding mechanism, comprising an air-exhausting means, a pipe provided with a plurality of mouthpieces, journals about which said pipe and mouthpieces may turn in adjusting the angle the faces of mouthpieces are to make with the sheet to be lifted, the pivotal axis lying in the same plane with the faces of the mouthpieces and aligned with that margin of the said faces which are farthest back from the edge of the sheet, and a conduit 2 connecting said mouthpieces with the exhausting means.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

ALEXANDER LAGERMAN.

Witnesses:

ERNST SVANGVISE,  
ROBERT APELGREN.