C. OWENS.

AUTOMATIC FEEDER.

APPLICATION FILED NOV. 17, 1910.

998,116.

Patented July 18, 1911.

2 SHEETS—SHEET 1.

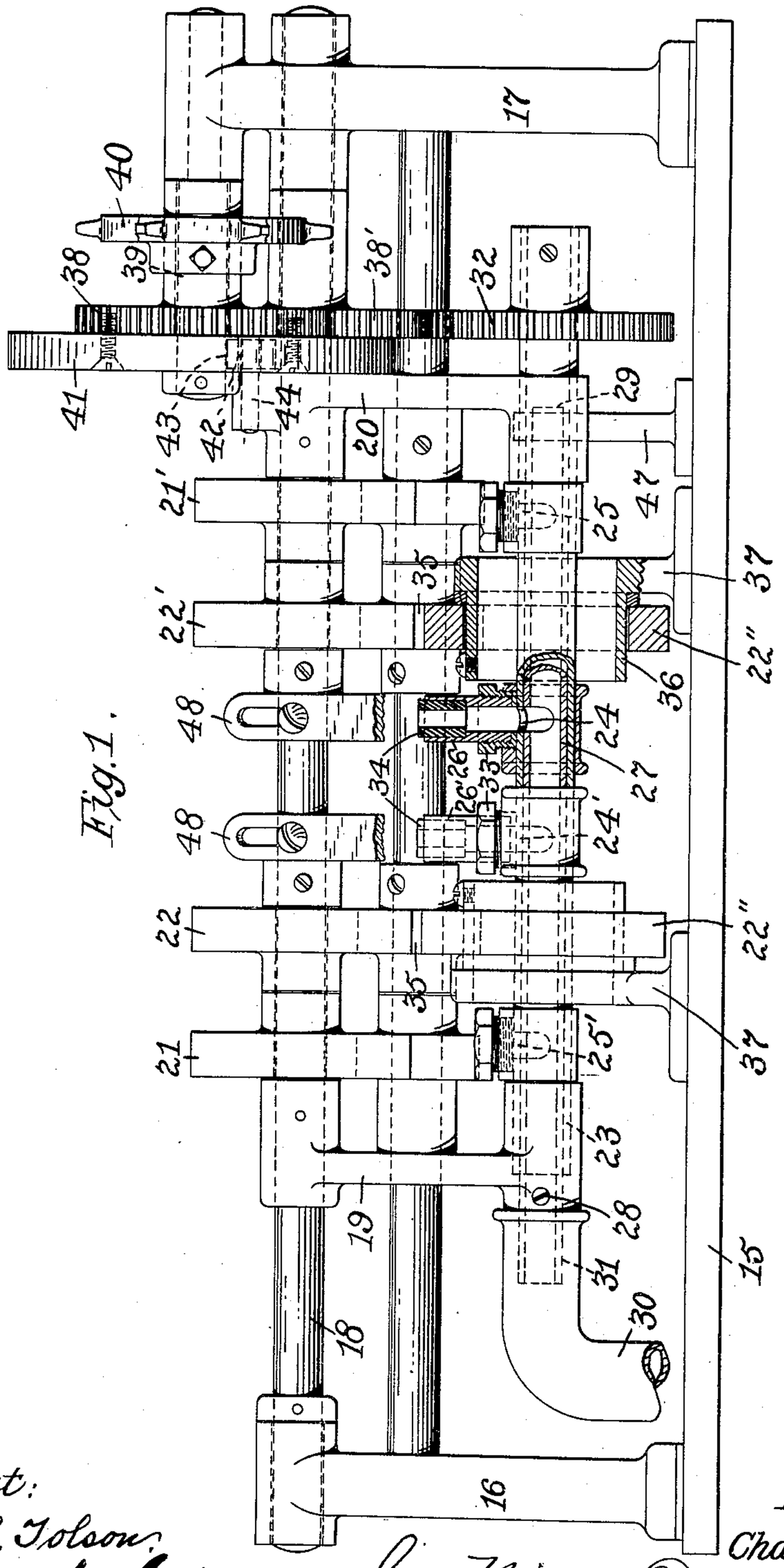


Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 2.

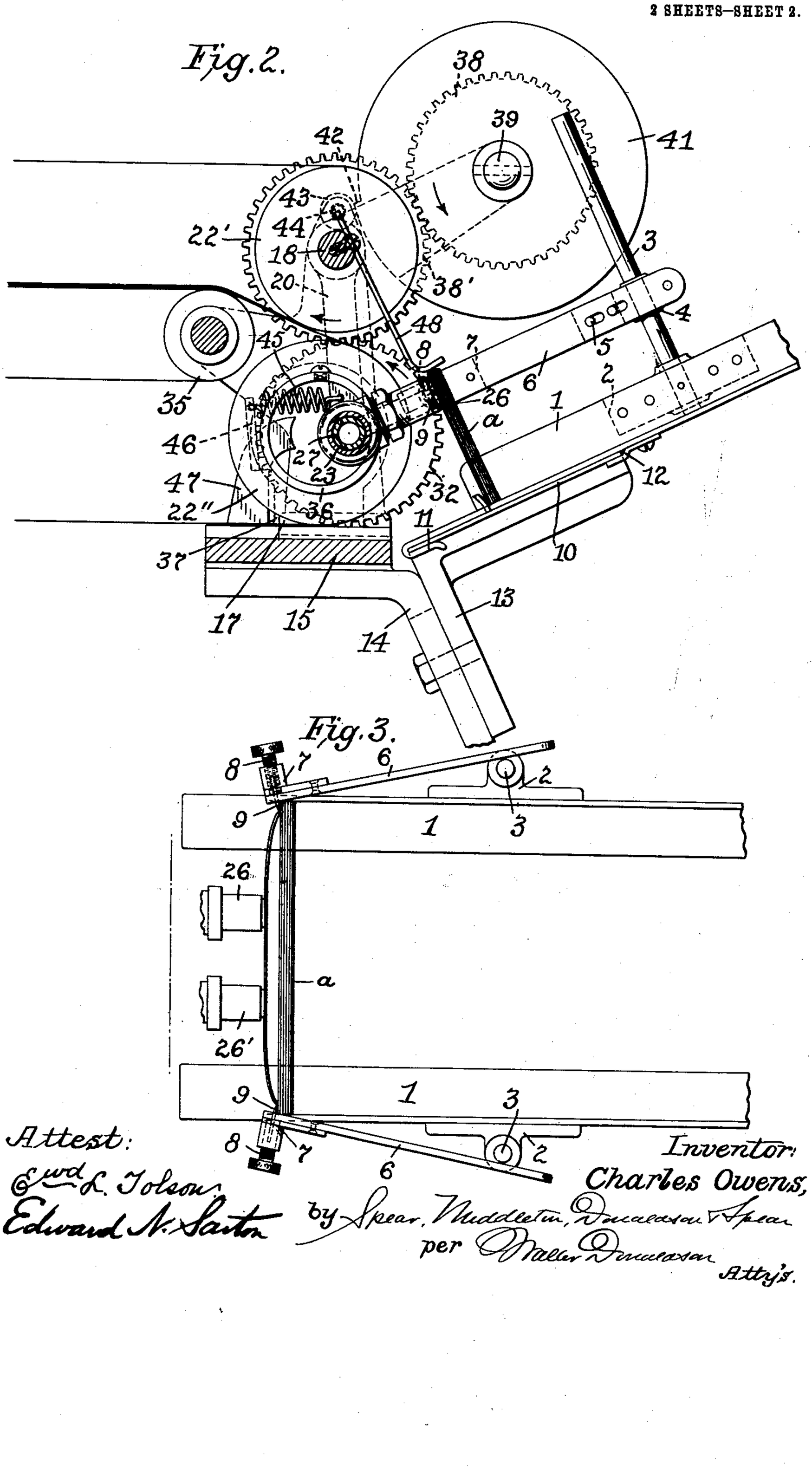


Fig. 3.




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# UNITED STATES PATENT OFFICE.

CHARLES OWENS, OF NEW YORK, N. Y., ASSIGNOR TO MONTAGUE MAILING MACHINERY CO., A CORPORATION OF TENNESSEE.

## AUTOMATIC FEEDER.

998,116. Specification of Letters Patent. Patented July 18, 1911.

Application filed November 17, 1910. Serial No. 592,861.

*To all whom it may concern:*

Be it known that I, CHARLES OWENS, citizen of the United States, residing at New York city, New York, have invented certain new and useful Improvements in Automatic Feeders, of which the following is a specification.

My invention relates to pneumatic feeding mechanism for automatically feeding single sheets of paper, envelops, post cards and the like, and it consists in the features of construction and combination and arrangement of parts hereinafter described and particularly set forth in the appended claims.

In the accompanying drawings, Figure 1 is a front view of an apparatus embodying my invention, a portion thereof being in section; Fig. 2 is an end elevation looking from the left of Fig. 1 with parts in section; Fig. 3 is a detail plan view of the hopper or holder for the sheets or other articles to be fed, showing also a portion of the pneumatic tubes.

The feed chute or hopper comprises angle irons 1 each of which has fixed to its outer side a bracket 2, supporting an upright or post 3. Adjustably mounted on these posts are brackets 4 to which are adjustably connected at 5 feed gages 6 which carry at their ends brackets 7 having screw threaded openings for receiving screws 8 which are provided at their inner ends with points 9.

The sheets or other articles to be fed are indicated at *a*, set up on edge on the inclined angle irons 1 of the chute, their upper portions lying between the converging gages 6. The points or pins 9 afford bearings for the stack of sheets near the upper front edge of the said stack, as indicated in Figs. 2 and 3. These points serve not only to support the pile of sheets, but also aid in the feeding action to secure a separation between the first sheet and the rest of the pile, as will be hereinafter described. The angle irons 1 of the chute rest upon a bed piece 10, being held thereto by the hooked front portions of the angle irons at 11, and by the clips 12, this connection permitting the angle irons 1 of the chute to be adjusted toward or from each other along the bed 10. The bed 10 is supported by a bracket 13. The bracket 13 is adjustably mounted on a bracket 14, and there are two of these brackets 13. The bracket 14 is rigidly secured to a bed piece 15 carrying standards 16 and 17, and these support a shaft 18 which is loosely journaled in the said brackets. This shaft has pinned thereto swinging depending arms 19, 20, and it carries loosely tape wheels or pulleys 21, 21′, 22 and 22′. Loosely mounted to rotate in the lower bearings of the swinging arms 19 and 20 is a tube 23 having ports at 24, 24′, 25 and 25′. This tube carries nozzles 26, 26′, the openings through which communicate with the ports 24, 24′. Within the tube 23 a second tube 27 is arranged having ports corresponding to those in the tube 23, the said inner tube being fixed as at 28 to one of the depending swinging arms 19, the said inner tube terminating at the point 29 within the lower bearing of the arm 20. The suction pipe 30 is connected with the inner tube 27 at 31. The outer tube 23 extends beyond the inner tube at the right of Fig. 1, and it has fixed to its projecting end a gear wheel 32 by which this tube is turned, as will be hereinafter described. The tubes 26 and 26′ are screw-threaded into plugs 33 on the outer tube 23, and similar plugs are arranged on the outer tube opposite the ports 25, 25′, and while I have not shown suction tubes or nozzles in these last mentioned plugs, it will be understood that such tubes may be placed in when the length of the sheet or card to be fed is of such length as to require the service of these additional suction nozzles. The suction nozzles may be provided with rubber contact mouths, as indicated at 34.

It will be understood that the outer tube 23 is closed at its right hand end in Fig. 1. It will also be understood that the ports in the outer tube 23 register with those in the fixed inner tube just prior to the contact of the suction rubbers 34 with the pile of sheets held in the chute, and these parts continue to register until the sheet which is to be fed has been drawn from the pile and delivered into the conveying or feeding tapes hereinafter described. The tape rolls 22 and 22′ have companion rolls 22″, and there are small directing rolls for the tapes, as shown at 35, Fig. 2, which are suitably

supported in arms of the frame. There may be four sets of tapes, for which purpose the rolls 21, 21′, 22 and 22′ are provided. The tape rollers 22″ are mounted upon sleeves 36, through which the tubes 23 and 27 pass, the said sleeves being, as shown in section in Fig. 1, of an interior diameter considerably larger than the exterior diameter of the said tubes, and these sleeves are supported by the brackets or standards 37. The purpose of this construction is to allow the pneumatic tubes 23 and 27 to have an oscillating movement within the sleeve for the purpose as will be hereinafter described.

For rotating the outer tube 23, together with the suction nozzles, the following gearing is provided: A gear 38 is loosely mounted on a stud 39 supported in the standard 17, and this gear is driven through any suitable means, such as by a sprocket wheel fixed to the hub of the gear, as at 40. The gear 38 meshes with a gear 38′ loose on the shaft 18 and this gear, in turn, meshes with the gear 32 to transmit motion to the hollow shaft or carrier 23 of the suction nozzle. Secured to the gear 38 by screws, as indicated in Fig. 1, is a cam wheel 41 having a shoulder at 42, Fig. 2. Upon the periphery of this cam wheel a roller 43 bears; which roller is carried loosely on a stud 44, projecting from the upper end of the depending swinging arm 20. A spring 45, Fig. 2, is connected with the lower end of this swinging arm, and to a fixed arm 46 connected with the standard or stop arm 47 supported rigidly on the base. This spring serves to keep the roller 43 pressed against the periphery of the cam wheel 41.

Fig. 2 shows the parts in the position assumed by them when the suction tubes are in the act of separating the first sheet from the rest of the pile, and it will be noticed that in this position the tubes 27 and 23 are in a position to the extreme right of the interior of the sleeve 36, the swinging arm 20 being at the limit of its swing to the right in Fig. 2. Normally, however, the tubes 23 and 27 lie axially in line with the axial center of the sleeve 36, being drawn in this position by the spring 45 and being arrested or held in this position by the stop 47. The length of the suction nozzles is such that their ends lie slightly beyond the plane of the peripheries of the tape rollers 22″, when the swinging arm, with the tubes 23 and 27, are in the position just described concentric with the sleeve 36.

At 48 are shown stop members consisting of arms fixed to the shaft 18 and having their lower ends bent, as shown in Fig. 2, to overlie a number of the sheets of the pile at the front thereof.

Assuming that the roller 43 is on the high part of the cam 41 as in Fig. 2, and that consequently the swinging arms 19 and 20 are in their extreme right hand positions shown in Fig. 2, the revolution of the tube 23 will have carried the suction nozzles up in the direction of the arrow, Fig. 2, to engage the first sheet of the pile and at the same time the stops 48 will have been carried to the right to the position shown in Fig. 2 above the first few sheets in the pile. As soon as the suction nozzle contacts with the pile the first two or three sheets will be pushed up against the stops 48 and will thus be loosened in a measure from the pile. The shoulder 42 on the cam wheel will at this instant pass the roller 43, and the swinging arms 19, 20, under action of the spring 45, will swing toward the left in Fig. 2, and thus the suction nozzles will be drawn to the left away from the pile of sheets and draw away the first sheet from the pile, this sheet being bowed or bellied out as indicated in Fig. 3, and its ends drawn from beneath the points or pins 9. In this way the first sheet will be drawn away, and the rest of the pile will be restrained by the pins 9.

The arrows in Fig. 2 indicate the direction of movement of the gears, and it will be seen that when the arms 19, 20 swing toward the left in Fig. 2 to draw the first sheet from the remainder of the pile, the gear 32 will roll on the gear 38′ at a speed equal to the peripheral speed of the gears, and thus the gear 32 will cease to rotate as the suction nozzles swing toward the left, and as a result the suction nozzles will move in a direct line or substantially in the direction of their length, and without revolution away from the pile until the swinging arms are arrested by the stop 47, when the revolution of the gear 32 will be again resumed in the arrow direction Fig. 2, thus lifting the sheet and causing its upper edge to be carried in between the feed tapes, which then take it and feed it forward, it being understood that at this time the ports in the tube 23 have been carried beyond those in the fixed tube 27, and the suction is thus cut off. When the suction nozzles retract to pull the sheet away from the pile, the stops 48 swing to the left, Fig. 2, and rub against the upper edges of the sheet and separate or loosen them ready for the next action of the suction nozzles thereon.

I do not limit myself to the details of construction, as these may be varied without departing from the spirit of my invention.

It will be noticed from Fig. 2 that there is an upper belt or tape passing around the upper rollers and a lower tape passing around the lower companion roller or pulley. This figure also indicates a tape passing around the idler 35, but this last mentioned tape is used only in connection with the outside idlers of the set. That is, the idlers

which coöperate with the upper pulleys or wheels 21 and 21′, there being no lower pulleys or wheels operating in connection with these outside wheels of Fig. 1.

I claim:—

1. In combination, a holder for the sheets, a suction nozzle, means for rotating the same to bring it to the pile of sheets, and means for stopping the rotation and for then retracting the nozzle substantially at right angles to the plane of the sheets when engaged with the first sheet, substantially as described.

2. In combination a holder for the sheets, a suction nozzle, means for rotating the same to bring it to the pile of sheets, and means for stopping the rotation and for then retracting the nozzle substantially at right angles to the plane of the sheets when engaged with the first sheet, said suction nozzle then continuing its revolution to deliver the sheet, substantially as described.

3. In combination a holder for the sheets, a suction nozzle, means for rotationg the same to bring it to the pile of sheets, means for stopping the rotation and for then retracting the nozzle substantially at right angles to the plane of the sheets when engaged with the first sheet, said suction nozzle then continuing its revolution to deliver the sheet, and delivery means for receiving the sheet, substantially as described.

4. In combination a holder for the sheets, tapes to convey the sheets away, and a suction nozzle having rotary movement alternating with a substantially rectilinear movement in respect to the sheets, the rotary movement ceasing while the rectilinear movement is taking place, substantially as described.

5. In combination a holder for the sheets, a suction nozzle, a rotary carrier therefor, a swinging support for said carrier to move the nozzle substantially at right angles to the face of the pile and means for rotating the carrier and swinging the support, substantially as described.

6. In combination a holder for the sheets, a suction nozzle having alternate rotary and rectilinear movement, a movable support for the axis of the nozzle and about which axis the nozzle makes complete revolutions, a suction connection extending to the axis of the nozzle, and controlling means whereby the suction is on when the nozzle engages the front sheet and continues while the nozzle is moved rectilinearly and when the rotary movement is resumed, the suction being then cut off for the delivery of the sheet, substantially as described.

7. In combination a holder for the sheets, a suction nozzle, a gear for rotating the suction nozzle, a gear meshing with the first gear, and a swinging support for the suction nozzle and its gear mounted axially of the second gear and means for swinging the said support away from the holder after the suction nozzle engages the front sheet, substantially as described.

8. In combination a hollow tape roll, a hollow shaft passing through the hollow tape roll and movable from side to side thereof, a suction nozzle carried by the hollow shaft, a holder for the sheets to be fed, means for rotating the hollow shaft to carry the suction nozzle to the pile of sheets, and means for moving the hollow shaft laterally in respect to the hollow tape roll to carry the nozzle toward and from the paper pile, substantially as described.

9. In combination a holder for the paper sheets, a tube having a port, a movable support therefor, a suction nozzle mounted to turn on the tube and having its passage to register with that in the tube, means for turning the nozzle on the said tube and means for moving the support toward and from the pile of sheets, substantially as described.

10. In combination a holder for the paper sheets, a nozzle, a gear wheel for rotating the nozzle, a swinging support for the nozzle, a gear meshing with the first gear and mounted axially of the swinging support, and a cam for swinging the support, substantially as described.

11. In combination a holder for the paper sheets, a nozzle having rotary and rectilinear movement, a gear wheel for rotating the nozzle, a swinging support for the nozzle, a gear meshing with the first gear and mounted axially of the swinging support, a cam for swinging the support, and means for controlling the suction to the nozzles to apply said suction when the nozzles contact with the paper sheet and the nozzle moves rectilinearly, and to cut off said suction after the nozzles have resumed rotation and carried the sheet to the desired point, substantially as described.

12. In combination a holder for the sheets to hold them on edge, a rotary nozzle with means for rotating the same and for moving the same at right angles to the face of the sheets, and a movable stop to rub over the upper edges of the sheets to separate them as the nozzle moves at right angles to the sheets, said stop being in position over the upper edges of the sheets as the nozzle rotates upwardly into its position at right angles to the sheets, substantially as described.

13. In combination a paper holder, a rotary nozzle to engage the body of the paper sheets, a stop against which the nozzle moves the front sheet, and means for moving the stop over the upper edges of the front sheets to separate them as the nozzle moves away from the paper sheets, substantially as described.

14. In combination a rotary nozzle, a pa-

per holder, a movable support for the nozzle to move it toward and from the paper, and a device connected with the movable support of the nozzle to move over the edge of the paper as the nozzle approaches the paper and to move away from the paper as the nozzle recedes, substantially as described.

In testimony whereof, I affix my signature in presence of two witnesses.

CHARLES OWENS.

Witnesses:
A. L. CONWAY,
GOLDIE L. ECKSTEIN.