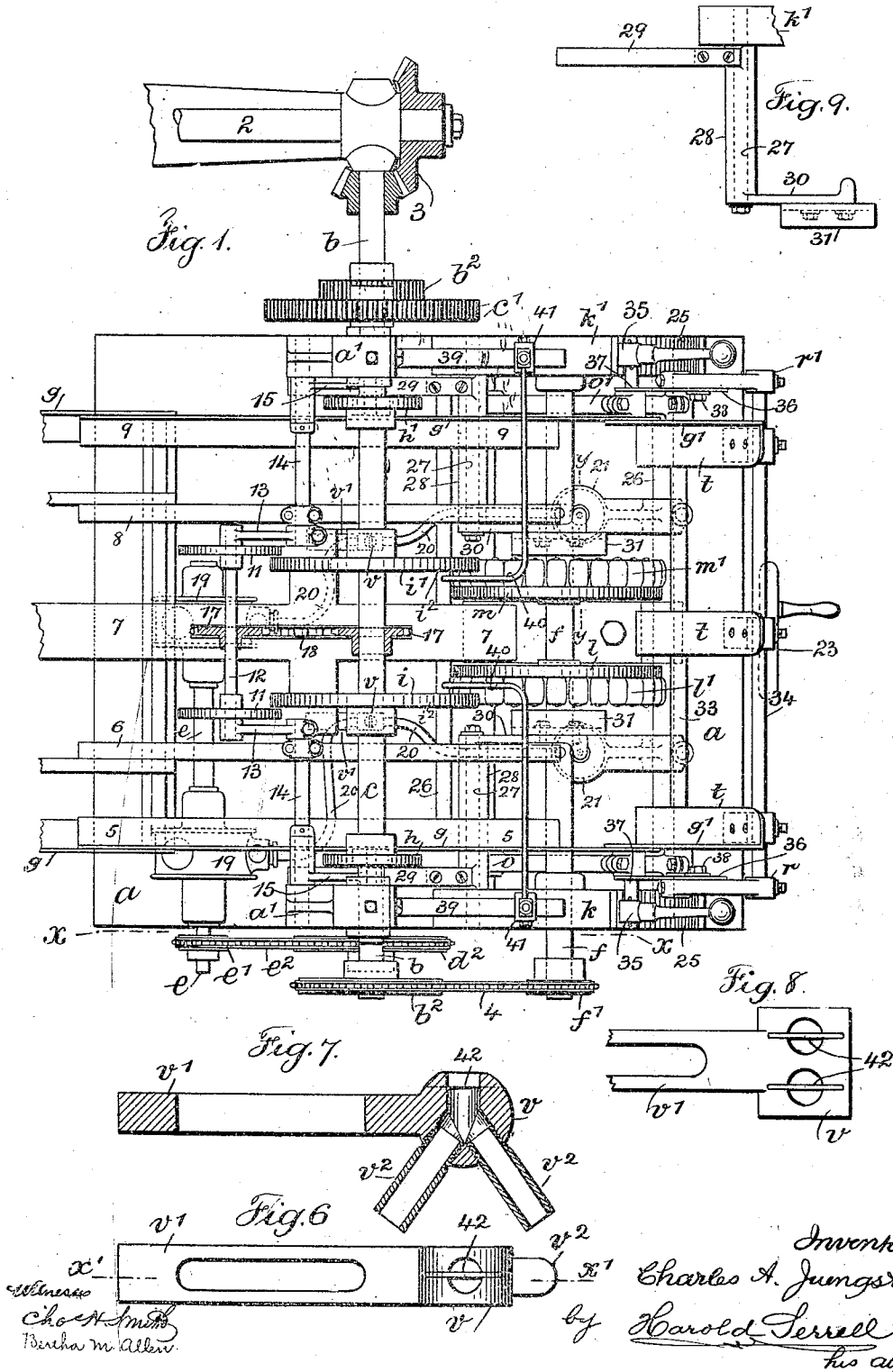


C. A. JUENGST.
MACHINE FOR FEEDING SHEETS TO FOLDERS, PRESSES, &c.
APPLICATION FILED JULY 14, 1911.

1,055,639.

Patented Mar. 11, 1913.

2 SHEETS-SHEET 1.

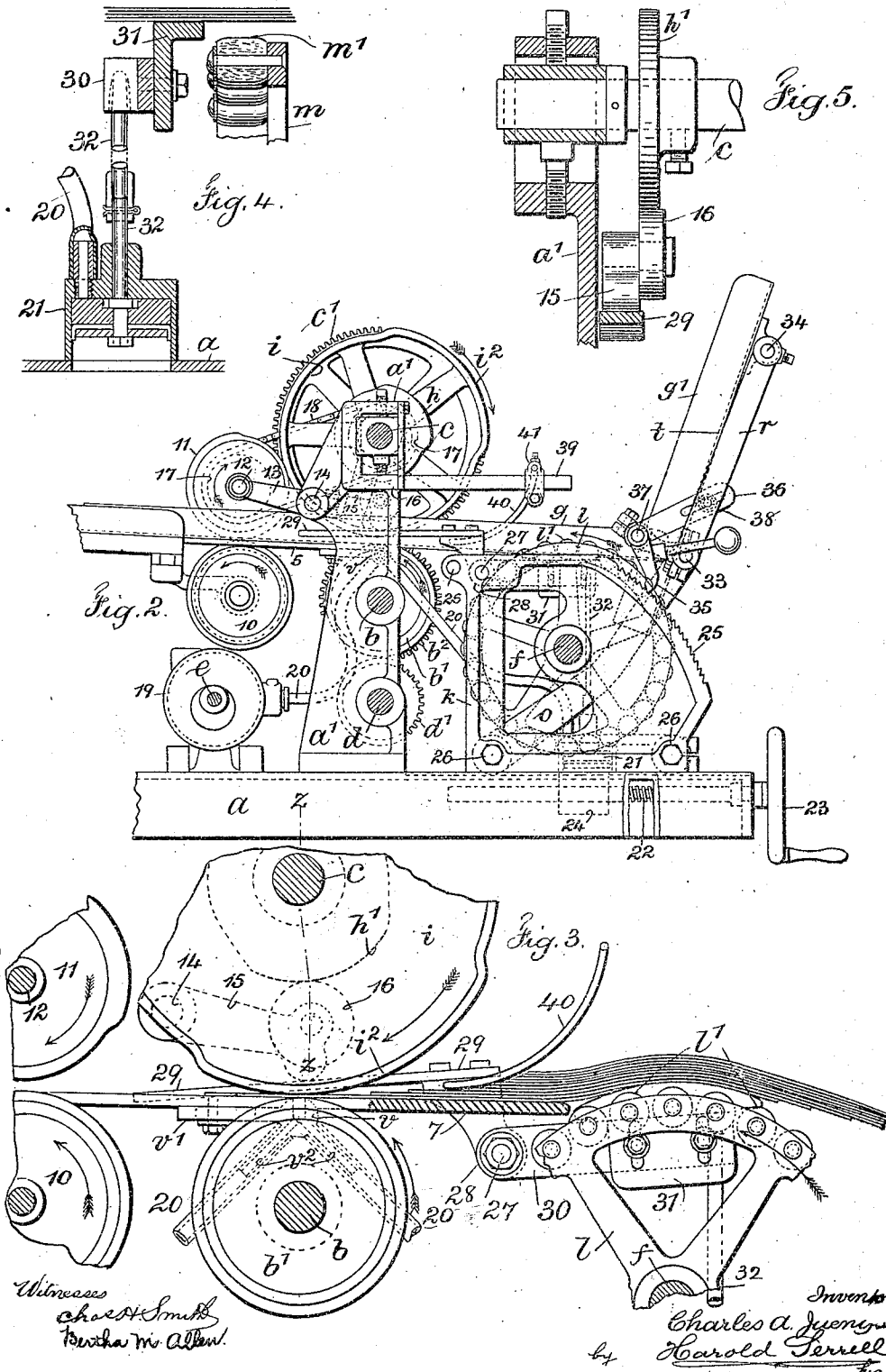


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2 SHEETS—SHEET 2.



BEST AVAILABLE COPY
UNITED STATES PATENT OFFICE

CHARLES A. JUENGST, OF CROTON FALLS, NEW YORK.

MACHINE FOR FEEDING SHEETS TO FOLDERS, PRESSES, &c.

1,055,639.

Specification of Letters Patent.

Patented Mar. 11, 1913.

Application filed July 14, 1911. Serial No. 638,442.

To all whom it may concern:

Be it known that I, CHARLES A. JUENGST, a citizen of the United States, residing at Croton Falls, in the county of Westchester and State of New York, have invented an Improvement in Machines for Feeding Sheets to Folders, Presses, &c., of which the following is a specification.

My invention relates to devices for feeding sheets progressively from a pile or bank of sheets to folding machines, printing presses or other devices where it is desired,—or to which it is desired,—to feed a sheet at a time for any purpose.

Heretofore sheets have been fed progressively, that is, one at a time from the top of the pile or bank of sheets, but difficulties have been experienced in preventing too many sheets being simultaneously delivered and in insuring only one sheet at a time being fed to the conveying devices therefor for the after manipulation and utilization of the sheet in any printing press, folding machine or other suitable machine.

In a device of my invention I provide means for supporting a superposed pile or bank of sheets, means for imparting thereto collectively the desired inclination and means assisting in shingling the sheets as they are supported in position. I also employ revoluble means for further shingling the sheets from the lower or bottom side of the pile or bank and so gradually forwarding each lowermost sheet from the pile of sheets into the main feeding device. I further provide automatically actuated devices for elevating the pile of sheets above the revoluble feeding devices as each sheet is gripped and moved by the forwarding rollers and which devices are assisted by pneumatically actuated devices, which latter are only released to again bring into operation the revoluble devices as each sheet leaves the main forwarding devices. I also employ pneumatic devices preferably at either side of the main forwarding devices,—the function of which is to steady and insure the even delivery of the sheets by the forwarding devices and simultaneously to hold and make effective the lifting devices also actuated pneumatically. The pneumatic action is effective during the passage of each sheet and only ineffective between sheets, all of which is hereinafter more particularly set forth.

In the drawing, Figure 1 is a plan repre-

senting the devices of my invention. Fig. 2 is a side elevation and section at about the broken line *x, x*, of Fig. 1. Fig. 3 is a diagrammatic elevation and partial section showing the principal features of my invention in exaggerated size over Fig. 2. Fig. 4 is a vertical section and partial elevation at about the broken line *y, y*, of Fig. 1 looking toward the right hand and in larger size for clearness. Fig. 5 is a vertical section and partial elevation at about the broken line *z, z*, of Fig. 3. Fig. 6 is a plan and Fig. 7 a longitudinal section at the broken line *w, w*, of Fig. 6 showing the essential parts of the pneumatic device of my invention. Fig. 8 is a view similar to Fig. 7 showing the pneumatic devices as double, and Fig. 9 is a plan showing certain sheet lifting devices.

a represents the bed of a machine of usual character. *a'* the two standards on the opposite side of the machine secured in any manner to the bed and occupying a vertical position. *b* is a power shaft in bearings about midway of said standards. At one end of said power shaft, as shown in Fig. 1, 2 represents a shaft in suitable bearings, on one end of which is a bevel-gear 3 meshing with a bevel-gear on the end of the power shaft so that by these means rotation and power are communicated to the power shaft of the machine; the power shaft, *per se*, being solely referred to in the description. On the shaft *b* spaced apart equal distances from the vertical center of the machine are rollers *b'*. In the upper part of said standards there is a shaft *c* in suitable bearings and in the lower part of said standards there is a shaft *d* also in suitable bearings. A shaft *e* is provided with suitable bearings to the left hand of the shaft *d* and about in the same horizontal plane.

On the shafts *b, c* and *d* there are gears *b² c¹* and *d¹* directly above one another in the same vertical plane and meshing with one another so that the gear *b²* on the power shaft *b* not only operates the gear *d¹* on the shaft *d* but also operates the gear *c¹* on the shaft *c*. On the shaft *d* and at the opposite end thereof from the gear *d¹* there is a sprocket *d²* and a sprocket *e¹* on the shaft *e*; a chain *e²* passing around the said sprockets for communicating the rotation of the shaft *a* to the shaft *c*. There is also a sprocket *b²* on the similar end of the shaft *b* and there is a shaft *f* having a sprocket *f¹* on a movable part of the machine hereinafter described,

and a chain 4 passes over the sprocket b^2 and f^1 to communicate the power of the shaft b to the shaft f . On opposite sides of the machine there are parallel fences or plates g forming guides for the sheets as they pass through the machine. These plate members usually are adjustable according to the width of the sheets. There are also sheet supports or plates 5 6 7 8 and 9 more or less in number, which are parallel to one another and occupy the same horizontal plane, and the sheets passing through the machine are moved over the surfaces of these supports or plates.

10 10 and 11 represent sheet feeding rollers of any press; the rollers 10 being in suitable bearings shown illustratively in Fig. 2 and which form no part of my present invention. The rollers 11 are advantageously supported and revolvable upon the shaft 12 and this shaft 12 is carried at its respective ends by arms 13 pivoted to fixed arbors 14 connected to and at the ends supported in standards a a^1 . These arms 13 at the hubs 25 which connect the same to the arbors 14 are preferably clamped to the arbors and these arbors may be provided with collars adjacent to said hubs for fixing the position of the said arms.

30 The parts hereinbefore described are usual in sheet forwarding devices and they form part of any usual sheet forwarding device, but form no necessary part of my invention.

35 The special features of my invention relate to the following devices: On the arbors 14 adjacent to the standards a^1 I provide arms 15 upon sleeves through which said arbors pass and on which said arms are adapted to move freely; the same preferably being located next to the standards by collars. These arms 15 at their free ends are advantageously weighted, that is to say, they are provided with a downward curved cam end shown plainly in Fig. 3 by dotted lines. These arms 15 carry rollers 16 and the shaft c is provided with cams h h^1 located directly above the rollers 16. Upon the shaft c there are also sheet forwarding rollers i i^1 which are located directly above the rollers b^1 on the power shaft b . These rollers i i^1 are placed in line with the movement of the sheets and have a portion of their periphery as a segment of greater diameter than the balance of the rollers as shown particularly in Figs. 2 and 3; and I provide sprockets 17 on the shafts c and 12 and a chain 18 extending between and over said sprockets whereby the rotation of the shaft c is communicated to the shaft 12 and to its rollers 11. The portions of the rollers i i^1 of greatest diameter run in close juxtaposition to the surfaces of the rollers b^1 and are thereby adapted to nip between them successive sheets to be forwarded; the sheet

forwarding movement being only between the parts i^2 of the rollers i i^1 and the rollers b^1 . In the lower portion of the machine I provide air exhaust pumps 19 associated with the shaft e and operated thereby. These pumps may be of any desired character and they are connected by the hose 20 to the pneumatic pumps 21. These pumps 21 are connected to and supported by a slidable frame member which is composed of similar side frames k k^1 supported upon the bed a and movable along the slide-ways of said bed; said similar side frames k k^1 being rigidly connected together by several rods 26,—three of said rods being shown. A part of said side frames comprises the racks 25 of curved form. This slidable member as a unit is held in position and may be moved over the surface of the bed by means of a depending nut 24, screw 22 and hand-wheel 23; said slidable member carrying the shaft f . On the opposite sides of the slidable member I provide arbors 27 fixed at one end to the side frames k k^1 and each carrying a sleeve 28, an arm 29 and an arm 30, each of which rock on the arbor 27. Each arm 29 comes below the weighted or cam end of the arm 15, said arm and its roller 16 bearing on the arm 29. Each arm 30 carries a head 31 adjustably connected thereto by bolts and slots as shown in Figs. 3 and 9. The under surface of each arm 30 is recessed and each recess comes directly over the center of the pneumatic pump 21; the rod 32 of the pump connected with the piston of the pump entering said recess; the function of said pump and its rod 32 being to lift the head 31 and the arm 30. This is also the function or functional tendency of the arm 15 and its weighted end and the roller 16 with each rotation of each cam h or h^1 with the rotation of the shaft c and the sheet forwarding rollers i i^1 .

From Fig. 4 it will be apparent that the rod 32 is made in two parts connected by a coupling sleeve pinned to one rod. The base of each coupling sleeve rests upon the top of the pump 21 which forms a support for the rod and piston when the parts are inactive. I provide on the shaft f wheels l m upon the outer faces of which are connected combing or shingling rollers l^1 m^1 composed of fiber cylinders on short arbors secured to the wheels. Attached to the movable member are upwardly inclined arms o o^1 pivotally connected to one of the rods 26. The upper ends of these arms o o^1 are pivotally connected to other arms r r^1 at the pivots 33; in other words, at the opposite ends of a shaft which forms the pivots 33; the arms r r^1 continuing the longitudinal continuity of the arms o o^1 . The extreme ends of the arms r r^1 are connected by a shaft 34 which also forms the pivotal connection with these ends of the arms of the

fence members $g^1 g^1$ which continue the longitudinal continuity of the fence members $g g$, and I provide sheet support plates t pivotally connected to the shaft 34 and the outer members of which are advantageously formed as one with the fence members $g^1 g^1$. I provide pawls 35 and brace bars 36 connected therewith upon pivots 37 common thereto. The pawls engage the racks 25 formed as parts of the movable frame member and the brace bars have a locking connection at 38 to the arms $r r^1$ which also assists in holding the fence members $g^1 g^1$ to the arms $r r^1$ for the reason that the pivotal connection 37 of the pawls and brace bars is upon the sides of the fence members $g^1 g^1$. I further provide bars 39 extending out horizontally from the standards a^1 and guide-fingers 40. These guide-fingers are shown especially in Figs. 1, 2 and 3. They are connected to adjustable heads 41 upon the bars 39 and they may be moved through said heads and clamped in position, or the heads and fingers may be made adjustable along the bars 39 so as to obtain by means of the two adjustments the proper position of the fingers 40. I provide between the shafts b and c and secured to parts of the support plate 7 pneumatic head devices v shown particularly in Figs. 6, 7 and 8. These form part of support arms v^1 which as will be seen from Figs. 1 and 3, extend back to connection with parts of the plate 7 and the head device v is made with diverging tubular members v^2 . One branch of the hose 20 is connected to one tubular member v^2 and the other branch of the hose 20 connected to the other tubular member v^2 so that the pneumatic device extends integrally from the pumps 19 through the head v to the pumps 21 and a pneumatic pressure is in evidence in the pumps 21 when there is a sheet overlying the heads v .

It will be noticed from Figs. 6 and 7 that the upper surface of the head v is flat and that across the head and centrally across the opening in the head is a plate 42. This plate 42 performs the function of preventing the sheet of paper being drawn down into the opening in the head. The small area of each head v provides for an efficient pneumatic or suction action, but not such a positive pneumatic or suction action as would hold the sheet to be forwarded immovably to the face of the pneumatic device so that any effort to forward the same would cause it to buckle or pucker. This surface provides not only for the holding action but allows a sufficient slip over the surface of the pneumatic device to enable the sheet to be forwarded between the rollers b^1 and i^1 .

In the operation of the device, the sheets as superposed in the machine to be forwarded are supported above the wheels $l m$ and their combing or shingling rollers $l^1 m^1$

upon the support plates 5 6 7 8 9 and the other support plates t and between the fences $g g$ and $g^1 g^1$ and preferably in an inclined position which is controlled by the position of the arms $o o^1$ and $r r^1$. It is possible to move along upon the bed of the machine the movable frame devices with the shaft f , the wheels $l m$ and their rollers, the arms $o o^1$ and $r r^1$, fences $g^1 g^1$ and the parts connected therewith as well as the pneumatic pumps 21 by means of the nut 24, screw 22 and hand-wheel 23, or duplicates of said screw, nut and hand-wheel according to the dimensions of the sheets that are to be forwarded and whatever the inclination imparted to the sheets or the superposed pile or bank, their forward edges will rest against the guide-fingers 40 and the sheets of the pile be more or less shingled by virtue of their support and their rest against these fingers.

In the operation of the device, the sheets are normally supported by the combing or shingling rollers $l^1 m^1$ of the wheels $l m$; the lowermost sheet of the pile resting thereon, and the rotation of the shaft f and the said rollers in the direction of the arrows has the tendency not only of shingling the sheets, but advancing the lowermost sheet of the pile; the shingling effect being partly controlled by the guide-fingers 40. The parts are so timed that the parts i^2 of the forwarding rollers $i^1 i^1$ come into position, as shown in Fig. 3, at about the moment that the advancing end of the lowermost sheet comes into position between the rollers b^1 and the part i^2 , when the sheet is taken between said parts and with their rotation advanced, and of course the moment the advancing end of the sheet comes over the flat face of the pneumatic heads v , the suction or pneumatic action is in evidence, and by virtue of the pumps 21 and their rods 22, the heads 31 and the arms 30 are lifted so that the pile of sheets is at once slightly elevated above the upper surface of the wheels $l m$ and their combing or shingling rollers $l^1 m^1$. Simultaneous with this action the cams $h h^1$ bear upon the rollers 16 and force the arms 15 at their weighted ends against the arms 29, assisting in this holding action; the latter parts bearing on the arms 29 being sufficient to hold up the parts 30 31 while the cams $h h^1$ bear upon the rollers 16 in their rotation in case the suction action at any time gives out and also to insure the holding up action so long as the sheets are being forwarded between the rollers b^1 and the parts i^2 into the grip of the rollers 10 and 11 which continue the forwarding action of each separate sheet. As soon as each sheet passes between the rollers 10 and 11 and from the bight of the parts i^2 of the rollers b^1 and i^1 , the cams h also pass out or away from their bearing

upon the rollers 16 and the sheet passing off of the pneumatic heads *v*, the pneumatic action is at once broken and the pistons of the pumps 21 and their rods fall with the parts 30 and 31, to again place the superposed sheets of the pile upon the support of the combing or shingling rollers *l' m'* of the wheels *l m* and the forwarding action hereinbefore described for one sheet is repeated for each succeeding sheet.

From the foregoing description and illustration it will be apparent that the suction devices *v v* and pumps 19 and 21 are in two series one at either side of the center line of the machine in the direction of motion and center line of the sheets; also that the rollers *i i'* and *b'* are similarly placed. Each series, that is, a pump 19, suction device *v* and pump 21 on one side of this line are operative and effective independently of the similar parts on the other side of this line, consequently in the operation of forwarding a sheet, if one side is advancing appreciably faster than the other side, that side first reaches a suction device *v* and is held and simultaneously its pump 21 lifts one end of the pile of sheets above the roller *i* or *i'*. The other side now advances until its advancing edge touches the other suction device and the other end of the pile of sheets is also lifted. The further advance of the sheet into the bight of the forwarding rollers is thereafter true and even.

I claim as my invention:

1. In a machine for feeding sheets to folders, presses, etc., and in combination, means for supporting a superposed pile or bank of sheets, means for feeding the sheets one at a time from the bottom of the pile, means for forwarding the sheets, means for temporarily elevating the pile of sheets above the said feeding devices as the forwarding devices act, and pneumatically operative devices which are active as each delivered sheet passes through the forwarding devices and which actuate and control the means for temporarily elevating a pile of sheets and which are inactive in the interim between the sheets.

2. In a machine for feeding sheets to folders, presses, etc., and in combination, means for supporting a superposed pile or bank of sheets, means for feeding the sheets one at a time from the bottom of the pile, means for forwarding the sheets, pneumatic devices for temporarily elevating the pile of sheets above said feeding devices as the forwarding devices act, means assisting the latter devices in holding the pile of sheets in an elevated position, said latter means acting when each sheet passes through the forwarding devices and said latter means and pneumatic devices simultaneously to effect the elevation of the pile of sheets.

3. In a machine for feeding sheets to

folders, presses, &c., and in combination, means for supporting a superposed pile or bank of sheets, revoluble devices for feeding the sheets, one at a time, from the bottom of the pile, means for forwarding the sheets, means adapted for temporarily elevating the pile of sheets above said feeding devices simultaneously with the action of the forwarding means, and pneumatically operative devices acting upon each sheet with the engagement thereof by the forwarding means and which at once pneumatically effects the movement of the means for temporarily elevating the pile of sheets.

4. In a machine for feeding sheets to folders, presses, &c., and in combination, means for supporting a superposed pile or bank of sheets, revoluble devices for shingling the sheets from the bottom of the pile upward at the advancing edges and simultaneously feeding the sheets, one at a time, from the bottom of the pile, means for forwarding the sheets, means adapted for temporarily elevating the pile of sheets above said feeding devices simultaneously with the action of the forwarding means, and pneumatically operative devices acting upon each sheet with the engagement thereof by the forwarding means and which at once pneumatically effects the movement of the means for temporarily elevating the pile of sheets.

5. In a machine for feeding sheets to folders, presses, &c., and in combination, means for supporting a superposed pile or bank of sheets, revoluble devices for shingling the sheets from the bottom of the pile upward at the advancing edges and simultaneously feeding the sheets, one at a time, from the bottom of the pile, means for forwarding the sheets, means adapted for temporarily elevating the pile of sheets above said feeding devices simultaneously with the action of the forwarding means, and pneumatically operative devices acting upon each sheet with the engagement thereof by the forwarding means and which at once pneumatically effects the movement of the means for temporarily elevating the pile of sheets, and automatically actuated devices for assisting in elevating and holding said sheets in an elevated position as each sheet passes through the forwarding devices.

6. In a machine for feeding sheets to folders, presses, etc., the combination with the bed of the machine and a sliding frame mounted thereon and means for operating the same, of a shaft and revoluble devices mounted thereon, support plates which together with said revoluble devices serve to support a superposed pile of sheets, adjacent swinging devices adapted also to act as supports for said sheets and means for operating the latter devices periodically so as to lift the sheets of the pile above the revoluble devices.

7. In a machine for feeding sheets to folders, presses, etc., the combination with the bed of the machine and a sliding frame mounted thereon and means for operating the same, of a shaft and revoluble devices mounted thereon, support plates which together with said revoluble devices serve to support a superposed pile of sheets, adjacent swinging devices adapted also to act as supports for said sheets, means for operating the latter devices periodically so as to lift the sheets of the pile above the revoluble devices, and devices having an adjustable relation and a pivotal relation to said slidable frame, whereby the desired inclination will be imparted to at least a portion of the pile of superposed sheets.

8. In a machine for feeding sheets to folders, presses, etc., the combination with the bed of the machine and a sliding frame mounted thereon and means for operating the same, of a shaft and revoluble devices mounted thereon, support plates which together with said revoluble devices serve to support a superposed pile of sheets, adjacent swinging devices adapted also to act as supports for said sheets, means for operating the latter devices periodically so as to lift the sheets of the pile above the revoluble devices, and devices having an adjustable relation and a pivotal relation to said slidable frame, whereby the desired inclination will be imparted to at least a portion of the pile of superposed sheets, pawls forming part of the last named devices and racks forming part of the sliding frame which are engaged by the pawls for determining the adjusted position of the said devices with relation to the slidable frame and the other sheet supporting means.

9. In a machine for feeding sheets to folders, presses, etc., the combination with means for feeding the sheets one at a time from the bottom of the pile and means receiving the sheets therefrom and forwarding the same, of pneumatic devices located in the machine beneath and associated with the means receiving and forwarding the sheets, air exhaust pumps connected therewith and pneumatic pumps also connected therewith and means actuated by said pneumatic pumps for temporarily elevating the pile of sheets above the feeding devices at and during the action of the sheet forwarding devices.

10. In a machine for feeding sheets to folders, presses, etc., the combination with means for feeding the sheets one at a time from the bottom of the pile and means receiving the sheets therefrom and forwarding the same, of pneumatic devices located in the machine beneath and associated with the means receiving and forwarding the sheets, air exhaust pumps connected therewith and pneumatic pumps also connected therewith

and means actuated by said pneumatic pumps for temporarily elevating the pile of sheets above the feeding devices at and during the action of the sheet forwarding devices, and automatically actuated devices for assisting the pneumatic devices in elevating the pile of sheets and holding the same in an elevated position as each sheet passes through the forwarding devices.

11. In a machine for feeding sheets to folders, presses, &c., and in combination, means for supporting a superposed pile or bank of sheets, means for feeding the sheets one at a time from the bottom of the pile, sheet forwarding rollers and a shaft therefor, other rollers and a shaft therefor beneath the same and co-acting therewith, cams on the former shaft, arbors and pivoted arms thereon having downward projections on their free ends, rollers mounted on the free ends of said arms above said projections and the rollers acted upon by said cams and pressed downward with said arms and projections, pivoted devices for temporarily elevating the pile of sheets above the said feeding devices, in part held by the said projections and associated parts, and means receiving and for forwarding the sheets.

12. In a machine for feeding sheets to folders, presses, &c., and in combination, means for supporting a superposed pile or bank of sheets, means for feeding the sheets one at a time from the bottom of the pile, sheet forwarding rollers and a shaft therefor, other rollers and a shaft therefor beneath the same and co-acting therewith, said first-named rollers each having a portion of their periphery of greater diameter and said part of sufficient length to contact with the other forwarding rollers in advancing each sheet, cams on the latter shaft, arbors and pivoted arms thereon having downward projections on their free ends, rollers mounted on the free end of said arms above said projections and the rollers acted upon by said cams and pressed downward with said arms and projections, pivoted devices for temporarily elevating the pile of sheets above the said feeding devices, in part held by the said projections and associated parts, and means receiving and for forwarding the sheets.

13. In a machine for feeding sheets to folders, presses, &c., and in combination, means for supporting a superposed pile or bank of sheets, means for feeding the sheets one at a time from the bottom of the pile, rollers and a shaft therefor, sheet forwarding rollers co-acting therewith and a shaft therefor, cams on the latter shaft, arbors and pivoted arms thereon having downward projections on their free ends, rollers arranged on the free end of said arms above said projections, and the rollers acted upon by said cams and pressed downward with said

arms and projections, pivoted devices for temporarily elevating the pile of sheets above the said feeding devices, in part held by the said projections and associated parts, means receiving and for forwarding the sheets, and pneumatically operative devices, acting when each sheet passes through the forwarding devices to elevate the pile of sheets, the same co-acting with the aforesaid devices for temporarily elevating the pile of sheets above the feeding devices.

14. In a machine for feeding sheets to folders, presses, &c., and in combination, means for supporting a superposed pile or bank of sheets, means for feeding the sheets one at a time from the bottom of the pile, rollers and a shaft therefor, sheet forwarding rollers co-acting therewith and a shaft therefor, cams on the latter shaft, said latter rollers each having a portion of their periphery of greater diameter and said part of sufficient length to contact with the other rollers in advancing each sheet, cams, on the latter shaft, arbors and pivoted arms thereon having downward projections on their free ends and the rollers mounted on the free end of said arms above said projections and the rollers acted upon by said cams and pressed down with said arms and projections, pivoted devices for temporarily elevating the pile of sheets above said feeding devices, in part held by the said projections and associated parts, means receiving and for forwarding the sheets, and pneumatically operative devices acting when each sheet passes through the forwarding devices to elevate the pile of sheets and the same co-acting with the aforesaid devices for temporarily elevating the pile of sheets above the feeding devices.

15. In a machine for feeding sheets to folders, presses, etc., the combination with means for supporting a superposed pile or bank of sheets, means for shingling the sheets from the bottom of the pile upward at the advancing edges and simultaneously feeding the sheets one at a time from the bottom of the pile, pneumatic or suction devices in the line of movement of the sheet and adapted to engage each sheet as delivered by the means for shingling and feeding the sheets, and revoluble means mounted at opposite sides of and operating in line with the movement of the sheets and with said pneumatic devices for receiving and for forwarding the sheets.

16. In a machine for feeding sheets to folders, presses, etc., the combination with means for supporting a superposed pile or bank of sheets, revoluble means for shingling the sheets from the bottom of the pile upward at the advancing edges and simultaneously feeding the sheets one at a time from the bottom of the pile, pneumatic or suction devices in the line of movement of

the sheet and adapted to engage each sheet as delivered by the means for shingling and feeding the sheets, and revoluble means mounted at opposite sides of and operating in line with the movement of the sheets and with said pneumatic devices for receiving and for forwarding the sheets.

17. In a machine for feeding sheets to folders, presses, etc., the combination with means for supporting a superposed pile or bank of sheets, revoluble devices for shingling the sheets from the bottom of the pile at the advancing edges and simultaneously feeding the sheets one at a time from the bottom of the pile, suction devices adapted to engage the advancing edge of each sheet substantially as it is delivered from the revoluble feeding devices, revoluble devices mounted at opposite sides of and operating in line with the movement of the sheets and with said pneumatic devices for receiving and for forwarding the sheets, which are constructed with a portion of their periphery for engaging the sheets, whereby the suction devices engage the sheets momentarily until the forwarding devices come into play.

18. In a machine for feeding sheets to folders, presses, etc., the combination with means for supporting a superposed pile or bank of sheets, devices for shingling the sheets from the bottom of the pile at the advancing edges and simultaneously feeding the sheets one at a time from the bottom of the pile, said shingling devices coming at opposite sides of the center of the sheet and center of movement, suction devices adapted to engage the advancing edge of the sheet substantially as it is delivered from the revoluble feeding devices, pneumatic devices co-acting with the suction devices for temporarily elevating the pile of sheets above the said feeding devices, said suction and pneumatic elevating devices also being at opposite sides of the center of the machine or center of movement and adapted to act independent of one another, whereby the suction device and the lifting device on one side may act if the sheet is not advanced evenly and the suction and lifting devices on the other side act thereafter for performing the same function as soon as the sheet is evened up.

19. In a machine for feeding sheets to folders, presses, etc., the combination with means for supporting a superposed pile or bank of sheets, devices for shingling the sheets from the bottom of the pile at the advancing edges and simultaneously feeding the sheets one at a time from the bottom of the pile, said shingling devices coming at opposite sides of the center of the sheet and center of movement, suction devices adapted to engage the advancing edge of the sheet substantially as it is delivered from the rev-

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and for forwarding the sheets.

Signed by me this 5th day of July 1911.

CHAS. A. JUENGST.

Witnesses:

GEO. T. PINCKNEY,
E. ZACHARIASEN.

15