Dec. 27, 1966 A. J. STAINES 3,294,396

SHEET FEEDING MECHANISM HAVING A SINGLE CONTROL MEMBER FOR ACTUATING A SUCTION, AIR PRESSURE, AND PUMP MEANS

Filed Nov. 23, 1964 2 Sheets-Sheet 1

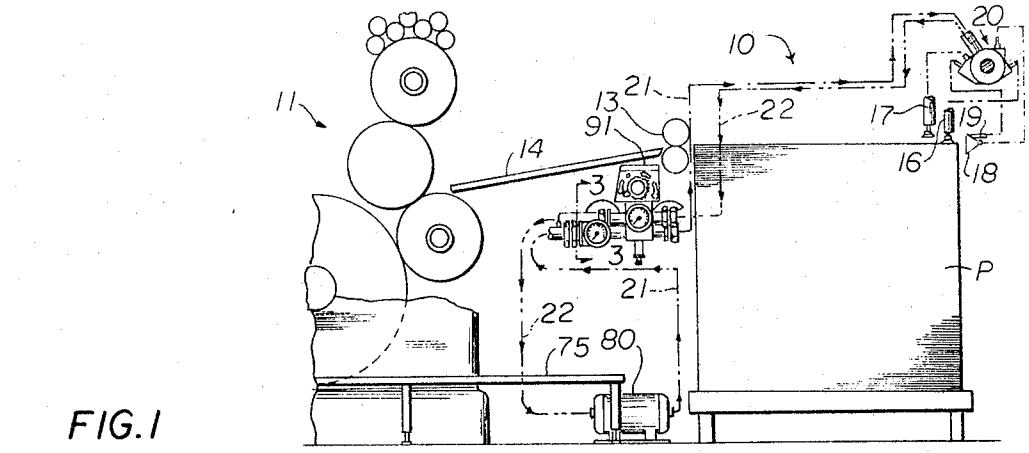


FIG. 1

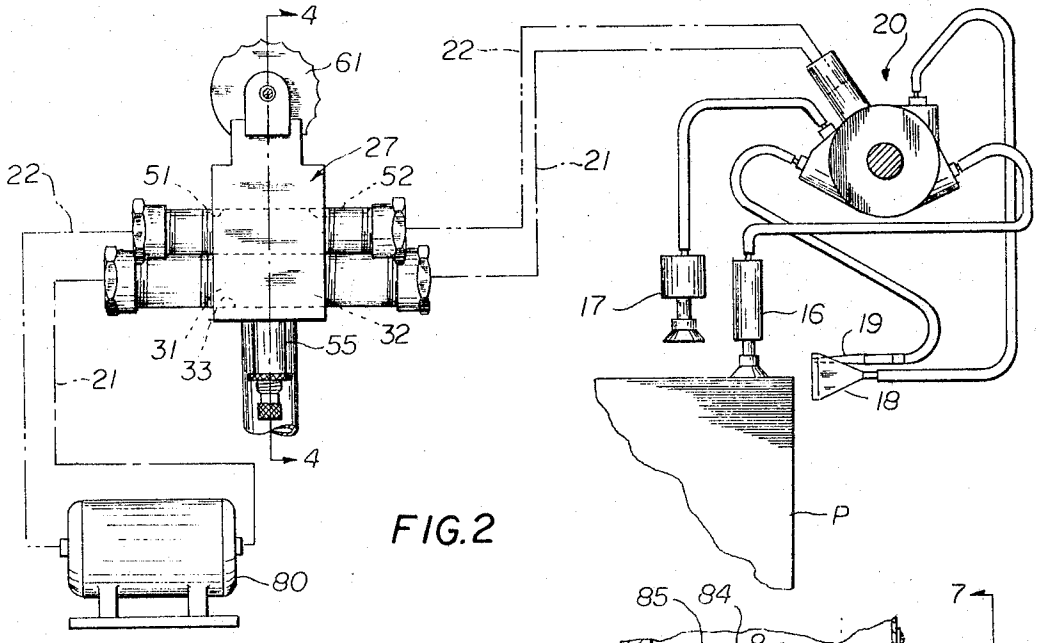


FIG. 2

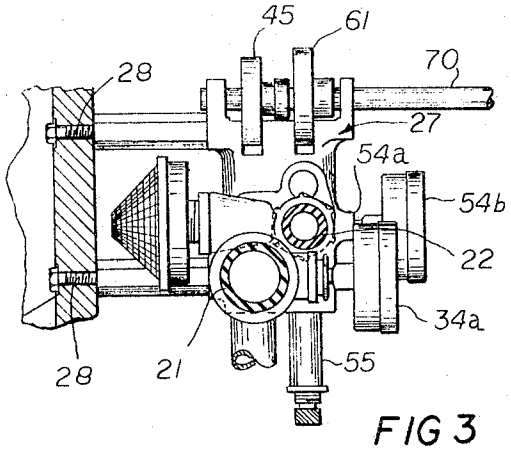
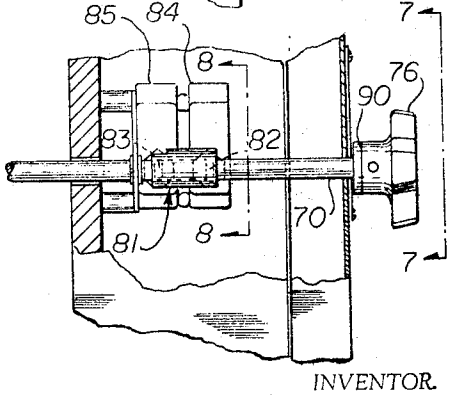


FIG 3



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Filed Nov. 23, 1964 2 Sheets-Sheet 2

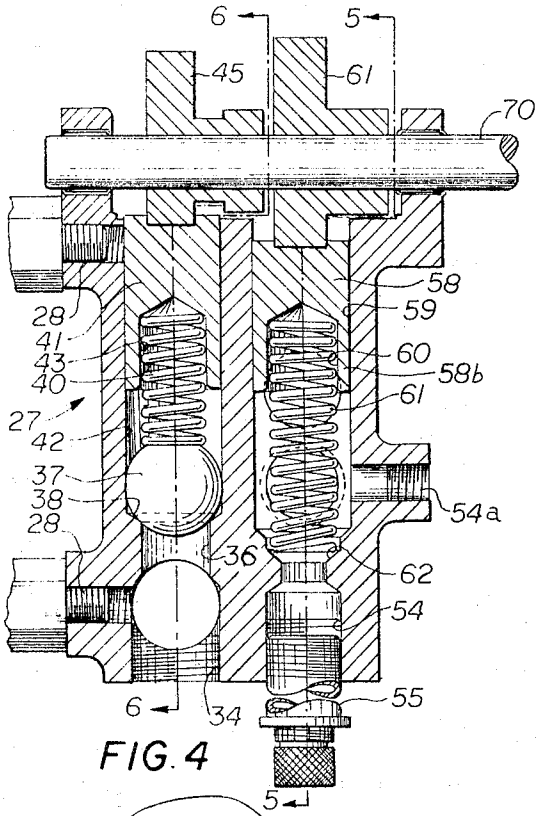


FIG. 4

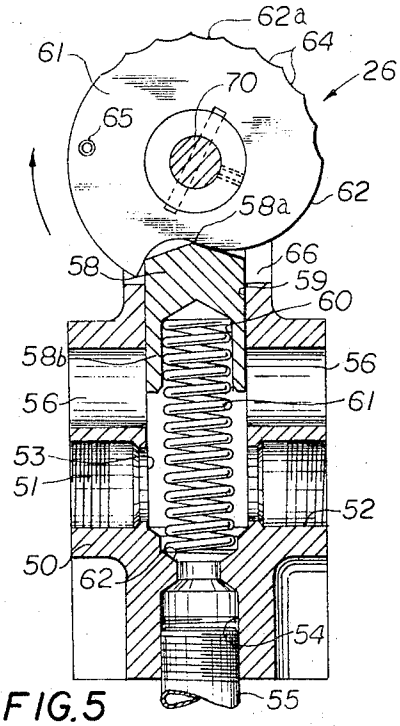


FIG. 5

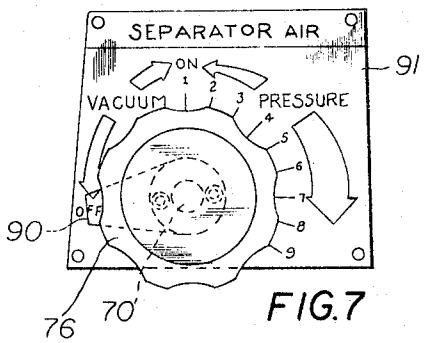


FIG. 7

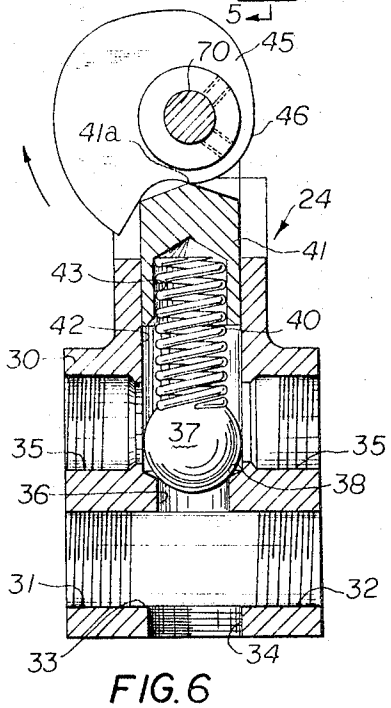


FIG. 6

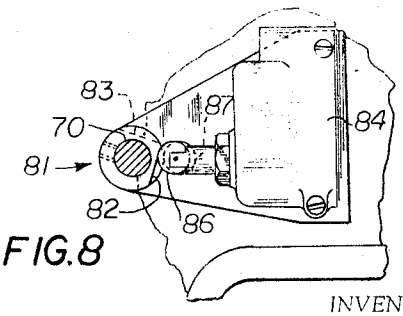


FIG. 8

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United States Patent Office 3,294,396 Patented Dec. 27, 1966

3,294,396

SHEET FEEDING MECHANISM HAVING A SINGLE CONTROL MEMBER FOR ACTUATING A SUCTION, AIR PRESSURE, AND PUMP MEANS

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Filed Nov. 23, 1964, Ser. No. 413,100
11 Claims. (Cl. 271—26)

The present invention relates primarily to a sheet handling apparatus and, particularly, to a sheet feeding apparatus having suction separator means for feeding individual sheets from a pile and an air nozzle means for directing a stream of air under the sheet being handled to assist in the separation and feeding thereof.

In the operation of a sheet feeder having suction sheet separator means and an air nozzle means, it is important to be able to control the pressure of the air flowing through the air nozzle means. Of course, the air pressure should not be on until the suction in the separator means is on. Moreover, the air pressure is generally controlled or varied depending upon the stock being fed and the speed of feeding thereof. Without such a control, the sheets in the pile may be disarranged or the sheet being fed may be improperly fed. In particular, it has been found that as the speed of the feeding of sheets increases, the air pressure should increase. Therefore, when the feeder is being jogged or is operating at low speeds, such as when starting, the air pressure should be low or zero. As the speed of feeding increases, the air pressure likewise should be increased.

Prior art sheet feeding mechanisms utilize valves in the suction and air pressure lines which are adjustable to vary the suction and air pressure directed to the separator means and air nozzles. These valves are separately adjusted and are located at a position remote from the operator's platform at which controls are located for controlling the speed of operation of the feeding mechanism. Thus, to make the valve adjustments, the operator must leave the operator's platform, make the separate adjustments to the valves in the air and suction lines, and then return to the operator's platform.

Accordingly, a principal object of the present invention is the provision of a new and an improved sheet feeding mechanism having suction separator means and air nozzle means and wherein valves for controlling the magnitude of the suction and the air pressure are adjustable by movement of a single control member.

Another principal object of the present invention is the provision of a new and an improved sheet feeding mechanism having suction separator means and air nozzle means and wherein valves for controlling the magnitude of the suction and the air pressure are adjustable by movement of a single control member accessible to an operator at the operator's platform.

Another important object of the present invention is the provision of a new and an improved sheet feeding mechanism having suction separator means and air nozzle means and wherein valves for controlling the magnitude of the suction and the air pressure, as well as the pump means for creating the suction and air pressure, are controlled and actuated by a single movable control member located at the operator's platform.

A further object of the present invention is the provision of a new and an improved sheet feeding mechanism having suction separator means and air nozzle means and valves for controlling the magnitude of the suction and the air pressure and means for adjusting the valves including separate cam members for actuating each of the valves and which are mounted for rotation with a shaft member which is rotatable by an operator on the operator's platform.

A still further object of the present invention is the provision of a new and an improved sheet feeding mechanism having suction separator means and air nozzle means and individual valves which are cam actuated for controlling the magnitude of the suction and the air pressure and wherein each of the valves has ports therein which are in communication with the atmosphere and with the suction or air pressure line, as the case may be, and wherein these ports provide for breaking the suction in the suction line and for the release of air pressure, respectively, and each valve includes a member movable to block communication between the ports and the suction or pressure line, respectively.

Further objects and advantages of the present invention will be apparent to those skilled in the art to which it relates from the following detailed description of the preferred embodiment thereof made with reference to the accompanying drawings forming a part of this specification and in which:

FIG. 1 is a schematic side elevational view of a mechanism embodying the persent invention;

FIG. 2 is a schematic view of an enlarged scale of a portion of the mechanism shown in FIG. 1;

FIG. 3 is a fragmentary cross-sectional view of the mechanism of FIG. 1, taken approximately on the section line 3—3 of FIG. 1;

FIG. 4 is a cross-sectional view of the mechanism shown in FIG. 2, taken approximately on the section line 4—4 of FIG. 2;

FIG. 5 is a cross-sectional view of the mechanism shown in FIG. 4, taken approximately along the section line 5—5 of FIG. 4;

FIG. 6 is a cross-sectional view of the mechanism shown in FIG. 4, taken approximately along the section line 6—6 of FIG. 4;

FIG. 7 is an elevational view of a portion of the mechanism shown in FIG. 3, looking at the mechanism of FIG. 3 as indicated by the line 7—7 thereof; and

FIG. 8 is a sectional view of the mechanism shown in FIG. 3, taken approximately along the section line 8—8 of FIG. 3.

The present invention provides an improved sheet feeding mechanism for feeding sheets to a work station and is shown in the drawings as preferably embodied in a sheet feeding mechanism 10 for feeding sheets to a printing press 11. The sheet feeding mechanism 10 is of the type wherein the topmost sheet of a pile P is fed into the nip of a pair of advancing rolls 13 located forwardly of the pile and which feed the sheet down a feedboard 14 into the printing press 11. The pile is generally supported on a suitable hoist which raises the pile as sheets are fed therefrom, so that the top of the pile is always at substantially the same level.

The sheets are fed from the pile P by suitable suction sheet-separating and feeding means. The suction sheet-separating and feeding means includes sheet-raising suckers 16 and sheet-forwarding suckers 17. The sheet-raising suckers 16 engage and grip the rear portion of the topmost sheet in the pile and move vertically to raise it from the next sheet on the pile and to the forwarding suckers 17. The forwarding suckers 17 grip the sheet raised by the suckers 16 and move the sheet forwardly toward the forwarding rolls 13 and move the forward or leading edge thereof into the nip of the rolls 13. The operating mechanism for the suckers 16 and 17 will not be described in detail since any well-known operating mechanism may be utilized, and reference may be made to applicant's co-pend application, Serial No. 332,596 for a specific showing of a particular type of mechanism for raising and lowering the suckers 16 and moving the forwarding suckers 17.

The sheet feeding mechanism 10 includes a means for

directing a stream of separating air to the edges of the uppermost sheets in the pile to, as is well known, ruffle the edges of the sheets and assist in separating the topmost sheet from the stack. The means for directing the stream of separating air includes air nozzles **18** located adjacent opposite sides of the pile and positioned to direct the air against the rear edges of the uppermost sheets in the pile. The sheet feeding mechanism **10** also includes means for directing a stream of floating or forwarding air between the topmost sheet of the pile and the next adjacent sheet in the pile toward the forward end thereof to assist in the separating of the topmost sheet from the pile and to facilitate moving the sheet forwardly. The floating air functions to provide a film of air between the topmost sheet and the pile to thereby separate or break the forward end of the topmost sheet from the next adjacent sheet so as to facilitate movement of the sheet forward by the forwarding suckers. The means for directing the floating air toward the forward end of the sheet comprises floating air nozzles **19** located to direct air under the topmost sheet in the pile and toward the forward end thereof.

The sheet floating air stream, the separating air stream, and the suction for sucker members **16** and **17** are all controlled by a single rotary valve **20** which connects the floating air nozzles **19** and separating air nozzles **18** to an air supply line **21** and which connects the sucker members **16** and **17** to a suction supply line **22** in timed relation with the operation of the sheet feeding mechanism. The particular construction of the rotary valve **20** forms no part of the present invention and will not be described in detail. It should suffice to say that the valve does include a valve member which is rotated in timed relation to the movement of the sucker members **16** and **17** and upon rotation, controls the suction in the sucker members and the air flowing through the various nozzles describes hereinabove. A particular type of valve which might be utilized for this purpose is shown in copending application, Serial No. 290,841, filed June 26, 1963, now Patent No. 3,226,107.

The control of the magnitude of the suction and air pressure is quite important in the sheet feeding mechanism. The air pressure should not be applied to the nozzles **18, 19** until suction of a degree sufficient to handle the sheets has been applied to the sucker members **16** and **17**. Moreover, the air pressure in the nozzles should be such as not to disarrange the sheets in the pile and to provide for effective feeding of the sheets. Generally, the air pressure should be adjusted depending upon the type of sheet stock being handled and the speed at which the sheets are being fed. The greater the speed of operation, the greater the air pressure should be.

Accordingly, the sheet feeding mechanism **10** includes a valve means **24** located in the air pressure line **21** and a valve means **26** located in the suction line **22**. The valves **24** and **26** have a common valve body **27** and are operable to control the magnitude of pressure and suction, respectively, in the lines in which they are located. The common valve body is secured in the frame of the mechanism by suitable screws **28**. The valve **24** is adjustable in order to vary the air pressure in the line **21**. Moreover, in accordance with the present invention, the valves are operated by an actuating means so as to effect full suction pressure at the suckers **16** and **17** prior to any pressure being directed through the nozzles **18** and **19**, and then increase of the air pressure in the nozzles **18, 19** without any increase in the suction applied to the sucker members **16** and **17**.

The valve **24** for controlling the air pressure in the air supply line **21** includes a valve body portion **30** forming a part of the common valve body **27**. The body portion **30** has an inlet opening **31** and an outlet opening **32** which are connected by a bore **33** and through which air pressure in the supply line **21** is directed. The body portion **30** may have an outlet opening **34** communicating with the bore **33** and leading to other mechanism in order to provide air pressure thereto, if desired. Moreover, a suitable air pressure gauge **34*a*** is located adjacent the valve **24** in the air pressure supply line **21**.

The body portion **30** of the valve **24** also includes a plurality of ports **35** communicating with the atmosphere. The ports **35** also communicate with the bore **33** by a passageway **36** extending therebetween. As viewed in the drawings, the passageway **36** is blocked by a movable member **37** comprising a spherical ball member. The ball member **37** is movable from the position shown in FIG. 6 wherein it engages a seat **38** and blocks any flow of fluid through the passageway **36** to the ports **35** to a position out of engagement with the seat **38** at which air may flow through the passageway **36** through the vent ports **35**.

The ball member **37** is biased by a spring **40** downwardly, as viewed in FIG. 6, into engagement with the valve seat **38** and, thus, is biased to a position wherein the ports **35** are blocked from communication with the bore **33**. It can be seen, of course, that when the ball **37** is in position blocking communication between the ports **35** and the bore **33**, air pressure flows through the valve inlet and outlet ports to the valve **20** which controls the flow of air to the air nozzles **18, 19**. Air pressure in the bore **33** acts on one side of the ball **37** and if sufficient to overcome the force of the spring **40**, will move the ball **37** away from the seat **38** and, thereby, provide a leak of air pressure to the atmosphere through ports **35**. Thus, the air pressure in the line **21** is reduced. Of course, if the bias of the spring **40** is greater than the air pressure, the ball **37** remains in engagement with the seat **38** and prevents leakage of air to the atmosphere and, therefore, provides maximum air pressure in the valve.

The air pressure in the air line **21** and nozzles **18, 19**, as should be apparent from the above, is a function of the bias on the spring **40** and as the bias on the spring **40** increases, the air pressure in the air line likewise increases. The bias on the spring **40** may be increased by movement of a plunger member **41** vertically in a bore **42** in the valve body portion **30**. The plunger member **41** has a passageway or opening **43** therein in which one end portion of the spring **40** is positioned. The other end of the spring **40**, of course, engages the surface of the ball member **37**. The plunger member **41** is movable in a vertical direction in the bore **42** by means of a cam member **45** which engages the upper surface **41*a*** of the plunger member **41** and the plunger member **41** is held in engagement with the surface of the cam **45** by the spring **40**.

In the position shown in FIG. 6, the plunger **41** is in its uppermost position and the bias on the spring **40** is at its lowest. In this position, air pressure directed into the bore **33** causes the ball **37** to move away from the seat **38** and causes leakage of the air pressure to the atmosphere and provides zero air pressure in the valve **20**. Upon movement of the cam **45** in a clockwise direction from the position shown in FIG. 6 for approximately 90 degrees, no increase in the compression of the spring **40** is effected because the cam surface portion **46** which will have engaged the upper surface **41*a*** of the plunger member **41** is a dwell surface. Further movement, however, of the cam member **45** will effect a lowering of the plunger member **41** causing compression of spring **40** and an increase in the biasing force of the spring **40** tending to hold the ball **37** in engagement with the seat **38**. This causes a reduction in the leakage of air past the ball **37** and an increase in the air pressure in the bore **33** and valve **20**. As the came member **45** is rotated, the amount of biasing force on the spring **40** is increased progressively so as to decrease the air leaking past the ball member **37** to the ports **35** leading to the atmosphere, thus progressively increasing the pressure in the bore **33** and, in turn, increasing the pressure in the valve **20** and nozzles **18, 19**.

The valve member **26** which is located in the suction line **22** is operable to control the amount of suction in the suckers **16** and **17**. The valve member **26** includes a

valve body portion **50** forming a part of the common valve body **27** and having a suction inlet port **51** and a suction outlet port **52** which are in communication with each other through a chamber **53**. A suitable passageway **54** also communicates with the chamber **53** and into which a relief valve member **55** may be positioned. The relief valve **55** is adjustable to determine the maximum suction pressure in the suction line. The valve **55** functions as a safeguard to prevent too great a suction build-up in the suction line. This valve is adjusted depending upon the pump and particular structure of the feeding mechanism **10**. The valve body portion **50** also has an opening **54***a* in communication with the chamber **53** and which leads to a gauge **54***b*. The body portion **50** of the valve **26** also includes a plurality of ports **56** in communication with the atmosphere. The ports **56** also communicate with the chamber **53** and provide a release for the suction in the chamber **53** when in communication therewith.

The valve **26** further includes a means for blocking off the ports **56** from the chamber **53**. This means comprises a plunger member **58** which is movable vertically, as viewed in FIG. 5, in a bore **59** in the valve body portion **50**. The plunger **58** has a suitable opening **60** in the bottom portion thereof, as viewed in FIG. 5, into which one end of a coil spring **61** is positioned, the other end of the coil spring bears against a spring seat **62** formed on the valve body portion **50**. The plunger member **58** is moved in the bore **59** by means of a cam member **61**. The cam **61** upon movement in a clockwise direction causes vertical lowering movement of the plunger **58** from the position in which it is shown in FIG. 5. Upon initial movement of the cam **61** in a clockwise direction, as viewed in FIG. 5, the surface portion **62** thereof engages the upper surface portion **58***a* of the plunger **58** and causes the plunger **58** to be moved vertically downwardly. As the plunger **58** moves downwardly, a portion **58***b* thereof moves to block ports **56** from chamber **53** and the amount of communication between the chamber **53** and the vent ports **56** is reduced. After the cam **61** is moved through approximately 90 degrees of rotation, the ports **56** are completely blocked from chamber **53** thereby providing maximum suction in the chamber **53** which, in turn, provides maximum suction in the sucker members **16** and **17**. Further rotational movement of the cam **61** does not change the suction pressure in the chamber **53** for a dwell portion **62***a* of the cam engages the plunger **58**. The dwell portion of the cam member **61** is provided with a plurality of indentations **64** which cooperate with surface **58***a* of the plunger **58** and tend to hold the cam **61** in the position to which it is rotated. The rotation of the cam **61** in the clockwise direction is limited by a stop means. The stop means comprises a pin **65** which projects outwardly of the cam **61** and engages a portion **66** of the body portion **50** when rotated to its limit in the clockwise direction.

The cam members **45**, **61** for actuating the valves **24**, **26** are part of a manually actuated operating means for operating these valves. The cams **45** and **61** are mounted on a common control shaft **70**. The control shaft **70** is rotatably supported by the common valve body at one end thereof and in the frame of the feeding mechanism. The cams **45** and **61** are fixedly secured to shaft **70** and positioned on the shaft **70** so that when the cam **45** is in the position shown in FIG. 6, the cam **61** is in the position shown in FIG. 5. Thus, in this position of the cams, the air and suction pressures are at a minimum and preferably zero.

The shaft **70** extends transverse to the direction of movement of the sheets and to a position adjacent an operator's platform **75** which is positioned between the printing press **11** and the pile of sheets P. The shaft **70** has a control knob **76** fixedly secured on the end thereof adjacent to the platform **75** and which is readily accessible to an operator standing on the platform **75**. An operator standing on the platform **75** therefore may rotate the knob **76** and, in turn, rotate the shaft **70** to control the air pressure and suction pressure. The controls for operating the printing press **11** and the feeder mechanism and to control the speed thereof are also located so as to be accessible to the operator standing on the platform **75**. Thus, an operator standing on the operator's platform **75** need not move from the platform **75** in order to adjust the air pressure in the nozzles **18**, **19** when the speed of the press is varied.

The air pressure and the suction applied to the valves **24**, **26** is created by a suitable pump means shown schematically in FIG. 1 and designated **80**. The pump means **80** may comprise any suitable single type of pump mechanism for providing air and suction in the air and suction lines **21** and **22**, respectively, or may comprise separate pumps. The pump means **80** is shown as a single pump mechanism actuated to provide the suction and air pressure upon initial rotation of the shaft **70** from the position shown in the drawings. To this end, the shaft **70** carries a trip member **81**. The trip member **81** comprises a cam or collar member rigidly secured to the shaft **70** for rotation therewith and has flats **82** and **83** spaced therealong. The trip member **81** cooperates with a pair of switch members **84**, **85** mounted in the frame of the machine adjacent thereto to effect actuation of the pump means **80**.

The switch means **84** is a normally open switch having a control member **86** which engages the periphery of the cam or trip member **81** and is actuated thereby. The switch **85** is a normally closed switch having a control member **87** which engages the periphery of the trip member **81** and is controlled thereby. The trip member **81** and the switches **84**, **85** are shown in FIG. 8 in the position in which they occupy when the shaft **70** and the cams **61** and **45** are in the position wherein minimum air and suction pressures are in the air and suction lines, respectively. In this position, the control member **86** of the normally open switch **84** is in engagement with the flat **82** on the periphery of the trip member **81**. In this position, the switch **84** is in its normal position with its switch contacts open. The switch **85**, however, is held out of its normal position by engagement of its control member **87** with the circular periphery of the trip member **81** and, thus, is open also.

When it is desired to apply suction and air pressure in the supply lines, the shaft **70** is rotated in a clockwise direction. Initial rotation of the trip member **81** clockwise, from the position shown in FIG. 8, causes the control member **86** for the switch **84** to ride off the flat **82** and into engagement with the periphery of the cam member **81**. This moves the control member **86** thereof to the right, as shown in FIG. 8, causing the contacts of the switch **84** to be closed. At substantially the same time, the control member **87** for the switch **85** moves into engagement with the flat **83** causing its switch contacts to take their normal position, namely, closed. In this position, with both switches closed, a circuit is completed through the contacts of the switches which are in series to a relay which establishes a holding circuit around the contacts of the switch **85** and, at the same time, energizes contacts in the circuit for the motor controlling the pump means **80**. Further movement of the trip means in the clockwise direction causes the control member **87** for the switch **85** to ride off flat **83** and onto the periphery of the trip member. This causes the control member **87** to move to the right and opens contacts of the switch **85**. The above-noted relay, however, remains energized, even though the switch **85** is returned to its open position, due to the holding circuit around the contacts of the switch **85**.

When it is desired to decrease the air pressure in the nozzles **18**, **19**, the shaft **70** is turned in a counterclockwise direction. Upon rotation of the shaft **70** in a counterclockwise direction, toward the position shown in FIG. 8, initially the circuit remains in a condition wherein the contacts of the switch **84** are closed, while the contacts

of the switch **85** are open. However, the flat **83** permits the control member **87** of the switch **85** to move outwardly causing closing of the contacts thereof. This performs no function at this time since a circuit is still maintained through switch **84** and the holding contacts around the contacts for the switch **85**. The flat **82** then comes into engagement with the control member **86** of the switch **84** causing the control member **86** to move to the left, as viewed in FIG. 8, causing the contacts of the switch **84** to open. This breaks the circuit to the relay which opens the contacts connected with the pump motor and the contacts of the holding circuit, thereby de-energizing the pump motor. The control circuit including the switches **84**, **85** thus functions to prevent operation of the pump after a power cutoff, without returning the trip member **81** and switches to the condition that they have when in the position shown in FIG. 7.

As best seen in FIG. 7, the sheet feeding mechanism includes an indicator **90** secured to the shaft **70** for movement therewith and an indicator plate **91** secured to the frame of the machine. The indicator plate has a zero or off position in which it is located in FIG. 8. As the shaft **70** is rotated to turn on the pump means **80** and increase the suction, the indicator **90** moves to indicate suction increase on the plate **91**. The plate **91** includes a plurality of numbers indicating different air pressures in the nozzles **18**, **19** and when the indicator points to a particular number, a corresponding pressure is applied to the nozzles **18**, **19**.

From the above description, the operation of the preferred embodiment of the present invention should be apparent. With the structure in the position wherein the cams **45** and **61** are in the position shown in FIGS. 5 and 6, and the switches **84** and **85** are in the position shown in FIG. 8, the indicator **90** is in a position, shown in FIG. 7, wherein it indicates that the vacuum pressure is zero and the air pressure is zero. Rotation of the shaft **70** in a clockwise direction, as viewed in FIGS. 7 and 8, does not affect the air pressure due to the fact that the cam dwell surface portion **46** of the cam **45** will be running in engagement with plunger surface **41***a* of the valve **24**. However, the suction is increased due to the fact that the portion **62** of increasing radius of the cam **61** forces the plunger **58** downwardly in the bore **59** of the valve **26**. Once the vacuum is fully on, the air pressure is then progressively increased upon further rotation of the shaft **70** and may be incrementally increased nine steps, as indicated on the indicator plate **91**, which cooperates with the indicator arrow **90**. The pressure is increased due to the fact that the portion of increasing radius of the cam **45** now runs in engagement with the plunger **41** of the valve **24** and forces the plunger **41** of the valve **24** downwardly to increase the bias of the spring **40**. Upon reverse rotation of the shaft **70** initially, of course, the pressure in the air line **21** is decreased to a point where it is reduced to a minimum, and then the pressure in the suction nozzles is decreased to the point where it is entirely off, and the cam members have been returned to the position shown in FIGS. 5 and 6, at which time the switches **84** and **85** are operated to de-energize the pump means **80**.

From the above description, it should be apparent that applicant has provided a new and improved mechanism and that certain modifications, changes, and adaptations may be made therein by those skilled in the art to which it relates, and it is intended hereby to cover all such modifications, changes, and adaptations which fall within the scope of the appended claims.

What I claim is:

1. A sheet feeding mechanism for feeding sheet material from a pile comprising suction feed means for engaging the top sheet of the pile and feeding it forwardly thereof, nozzle means for directing a stream of air toward said sheet to assist in the feeding thereof, suction and air pressure supply lines leading from a source of suction and air pressure respectively to said suction feed means and said nozzle means respectively, first valve means in said suction supply line operable to control the pressure in said suction supply line, second valve means in said air supply line operable to vary the pressure in said air supply line, and actuating means for said first and second valve means effective to operate said first valve means to provide a predetermined suction pressure in said suction supply line and then subsequently operate said second valve means to apply air pressure to said air supply line of a progressively increasing magnitude including a single control member for operating said actuating means.

2. A sheet feeding mechanism for feeding sheet material from a pile to a sheet handling machine comprising suction sheet separating means for energizing the top sheet of the pile and feeding said sheet forwardly thereof, nozzle means for directing a stream of air toward said sheet to assist in the feeding thereof, suction and pressure supply lines leading from a source of suction and air pressure respectively to said suction feed means and said nozzle means respectively, an operator's platform adjacent said sheet handling machine and remote from said sheet separating means and on which the operator may stand and control the speed of operation of said separating means, first valve means in said suction supply line operable to control the pressure in the suction supply line, second valve means in the air supply line operable to vary the pressure in said air supply line, and actuating means for said first and second valve means effective to operate said first valve means to provide a predetermined suction in said supply line and then subsequently operate said second valve means to apply air pressure to said air supply line of a progressively increasing magnitude and including a single control member for operating said actuating means and accessible to an operator standing on said operator's platform.

3. A sheet feeding mechanism for feeding sheet material from a pile to a sheet handling machine comprising suction sheet separating means for engaging the topmost sheet of the pile and feeding it forwardly thereof, nozzle means for directing a stream of air toward the sheet being fed to assist in the feeding thereof, pump means for creating a suction pressure and an air pressure, suction and pressure supply lines connected with said pump means for delivering suction and air pressure respectively to said suction sheet separating means and said nozzle means, an operator's platform adjacent to said sheet handling machine and remote from said sheet separating means and from which an operator may control operation of said separating means, first valve means in the suction supply line operable to control the pressure in the suction supply line, second valve means in the air supply line operable to control the pressure in said air supply line, and actuating means for said first and second valve means effective to operate said first valve means to provide a predetermined suction in said suction supply line and then operate said second valve means to apply air pressure to said air supply line of a progressively increasing magnitude and including a single control member movable to operate said actuating means and accessible to an operator on said platform, and means for energizing said pump means in response to initial movement of said control member.

4. A sheet feeding mechanism for feeding sheet material from a pile comprising suction feed means for engaging the topmost sheet of the pile and feeding it forwardly thereof, nozzle means for directing the stream of air toward the sheet being fed to assist in the feeding thereof, pump means for creating a suction pressure and an air pressure, suction and pressure supply lines connected with said pump means for delivering suction and air pressure respectively to said suction feed means and said nozzle means, first valve means in the suction supply line operable to control the pressure in the suction supply

line, second valve means in the air supply line operable to control the pressure in said air supply line, and actuating means for said first and second valve means effective to operate said first valve means to provide substantial suction in said suction supply line and then operate said second valve means to apply air pressure to said air supply line of a progressively increasing magnitude and including a single control member movable to operate said actuating means, and means for energizing said pump means in response to initial movement of said control member.

5. A sheet feeding mechanism for feeding sheet material from a pile comprising suction feed means for engaging the top sheet of the pile and feeding it forwardly thereof, nozzle means for directing a stream of air toward said sheet to assist in the feeding thereof, suction and air pressure supply lines leading from a source of suction and air pressure, respectively, to said suction feed means and said nozzle means respectively, first valve means in said suction supply line operable to vary the pressure therein, second valve means in said air supply line operable to vary the air pressure therein, said first and second valve means each including a control member movable to control the pressure in their respective lines, first and second cam members associated with each of said first and second valve means and operatively connected with said control members respectively and operable upon movement to effect movement of said control members, and a shaft member carrying said first and second cam members and rotatable to effect rotation of said first and second cam members to move said control members of said first and second valve means, said first cam member having a cam surface operable to move said control member of said first valve to establish a suction of a predetermined degree in said suction feed means, and said second cam member having a cam surface operable to move said control member for said second valve to establish an air pressure in said nozzle means after suction is established in said suction feed means and with the air pressure progressively increasing upon continued movement of said control member.

6. A sheet feeding mechanism as defined in claim 5 wherein said first cam member has an actuating surface portion for effecting movement of the control member for said first valve means to increase suction in said suction line and a dwell surface portion, and said second cam member has a dwell portion for engaging the control member for said second valve means while said actuating surface portion of said first cam member engages the control member for said first valve means and an actuating portion for engaging the control member for said second valve means while said dwell portion of said first cam member engages the control member of said first valve means.

7. A sheet feeding mechanism as defined in claim 5 wherein said first valve means comprises a valve body having suction inlet and suction outlet ports and at least one vent opening to the atmosphere and communicating with said suction inlet and outlet ports, said control member for said first valve means comprising a plunger means movable by said first cam member to block communication of said inlet and outlet ports with said vent port, and spring means applying a biasing force against said plunger means to hold said plunger means in engagement with said first cam member.

8. A sheet feeding mechanism as defined in claim 5 wherein said second valve means comprises a valve body having inlet and outlet ports and at least one vent port communicating with the atmosphere and with said inlet and outlet ports, said control member for said second valve means comprising a plunger member, a movable member for at least partially blocking communication between said inlet and outlet ports and said vent port, spring means acting between said plunger member and said movable member and biasing said plunger member into engagement with said second cam member and said movable member into a position blocking communication between said inlet and outlet ports and said one vent port.

9. A sheet feeding mechanism for feeding sheet material from a pile comprising suction feed means for engaging the top sheet of the pile and feeding it forwardly thereof, nozzle means for directing a stream of air toward said sheet to assist in the feeding thereof, suction and air pressure supply lines leading from a source of suction and air pressure, respectively to said suction feed means and said nozzle means respectively, first valve means in said suction supply line operable to vary the pressure therein, second valve means in said air supply line operable to vary the air pressure therein, said first and second valve means each including a control member movable to control the pressure in said respective lines, first and second cam members associated with each of said first and second valve means and operatively connected with said control members respectively and operable upon movement to effect movement of said control members, a shaft member carrying said first and second cam members and rotatable to effect rotation of said first and second cam members to move the control members of said first and second valve means, pump means for creating said suction and air pressure, and means for energizing said pump means in response to rotation of said shaft member.

10. A sheet feeding mechanism as defined in claim 9 further including switch means actuatable to energize operation of said pump means and trip means carried by said shaft member and operable to energize said switch means to effect operation of said pump means upon initial rotation of said shaft member.

11. A sheet feeding mechanism for feeding sheet material from a pile comprising suction feed means for engaging the top sheet of the pile and feeding it forwardly thereof, nozzle means for directing a stream of air toward said sheet to assist in the feeding thereof, suction and air pressure supply lines leading from a source of suction and air pressure, respectively, to said suction feed means and said nozzle means, respectively, first valve means in said suction supply line operable to vary the air pressure therein, second valve means in said air supply line operable to vary the air pressure therein, said first and second valve means each including a control member movable to control the pressure in said respective lines, first and second actuating members associated with each of said first and second valve means and operatively connected with said control members respectively and operable upon movement to effect movement of said control members, said first actuating member being operable to move said control member of said first valve to establish a suction of a predetermined degree in said suction feed means, said second actuating member being operable to move said control member of said second valve to establish an air pressure in said nozzle means after suction is established in said suction feed means and with the air pressure progressively increasing upon continued movement of said control member by said actuating member, and a movable member carrying said first and second actuating members and movable to effect movement of said first and second actuating members to effect movement of said control members of said first and second valve means.

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