Feb. 23, 1954

J. F. BANTHIN

2,670,203

SHEET FEEDER FOR PRINTING PRESSES

Filed May 25, 1948

3 Sheets-Sheet 1

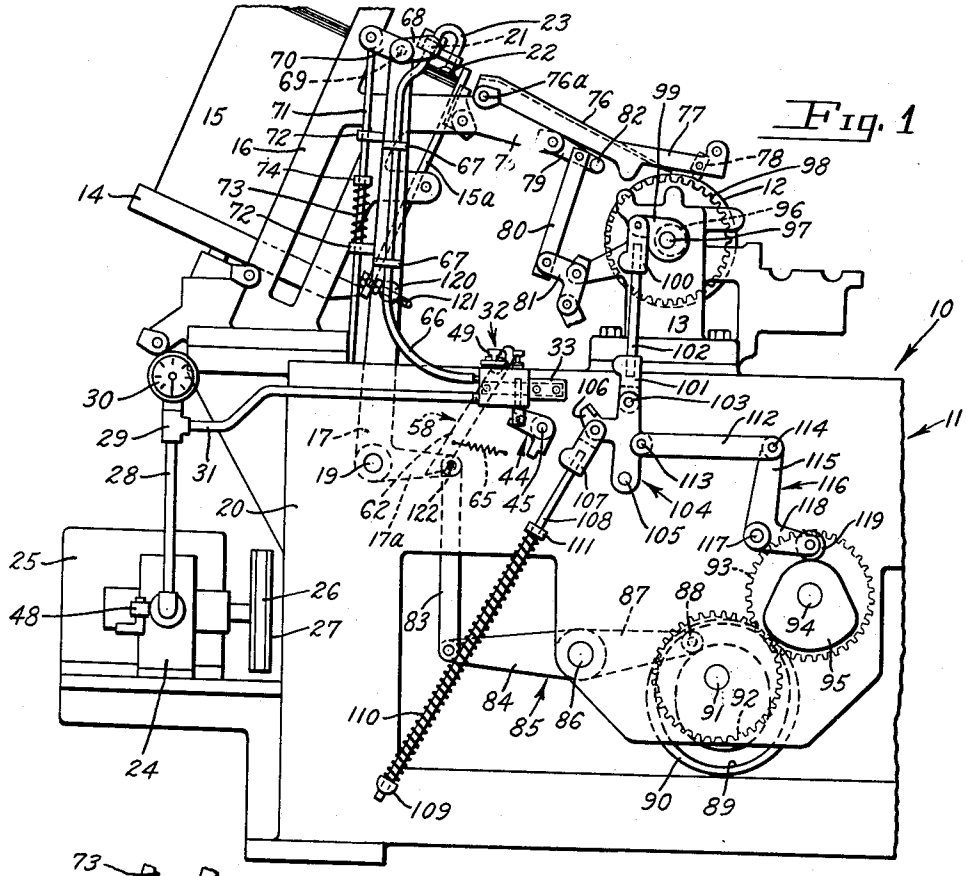


Fig. 1

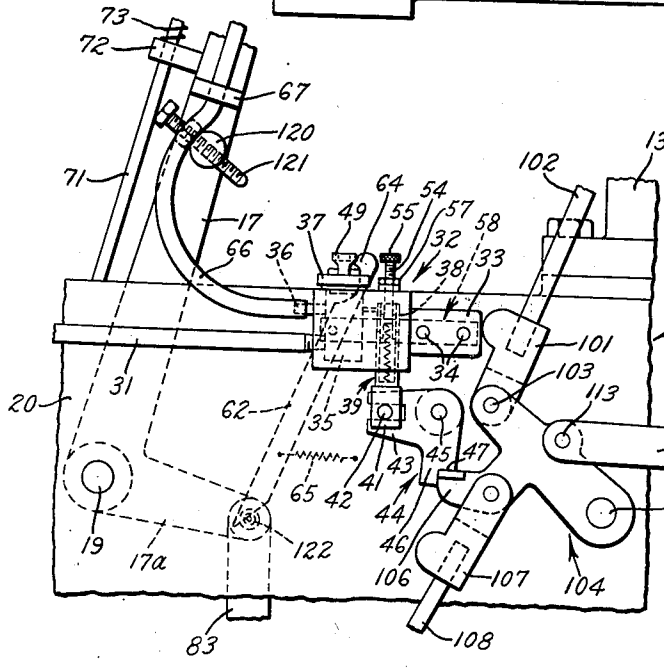


Fig. 3

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SHEET FEEDER FOR PRINTING PRESSES

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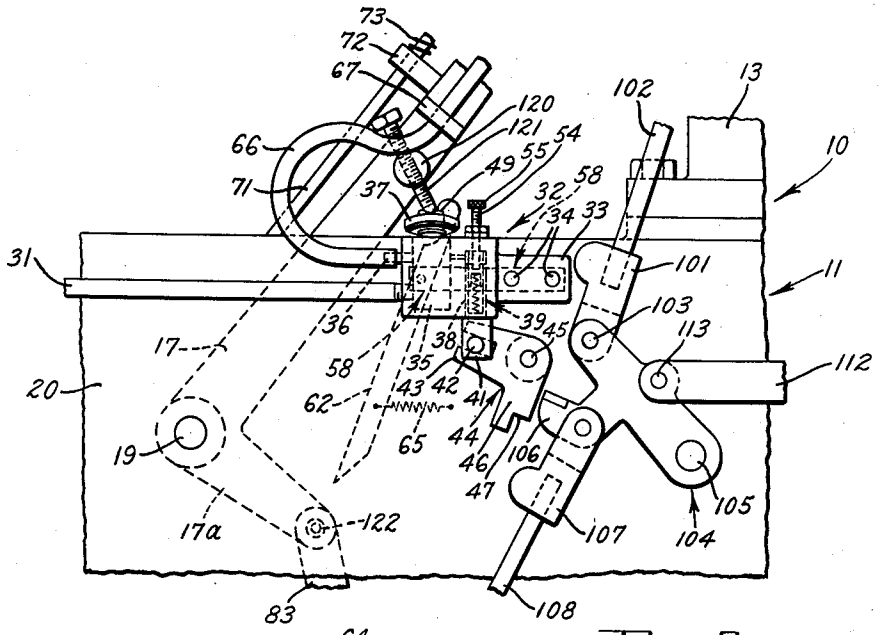


Fig. 2

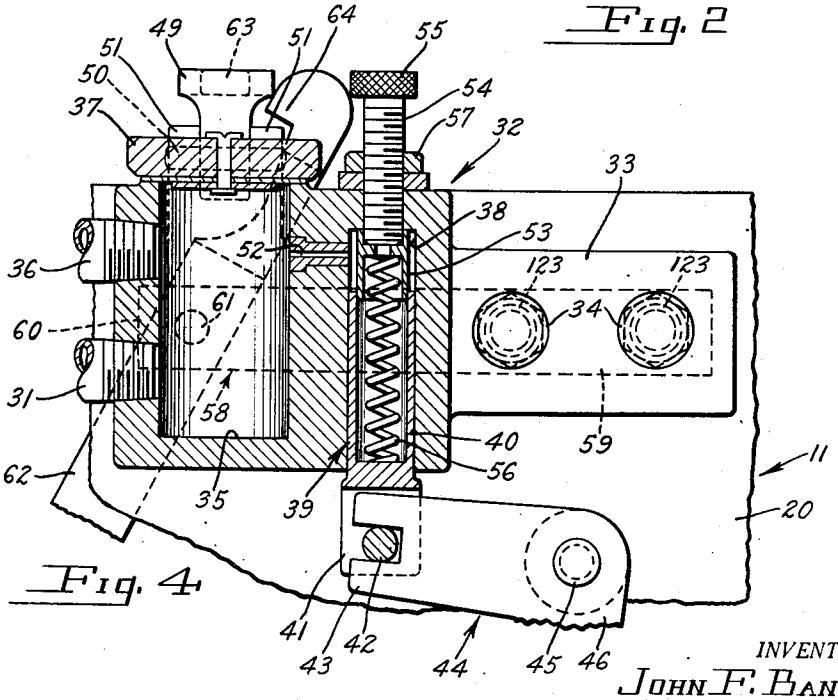


Fig. 4

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SHEET FEEDER FOR PRINTING PRESSES.

Filed May 25, 1948 3 Sheets-Sheet 3

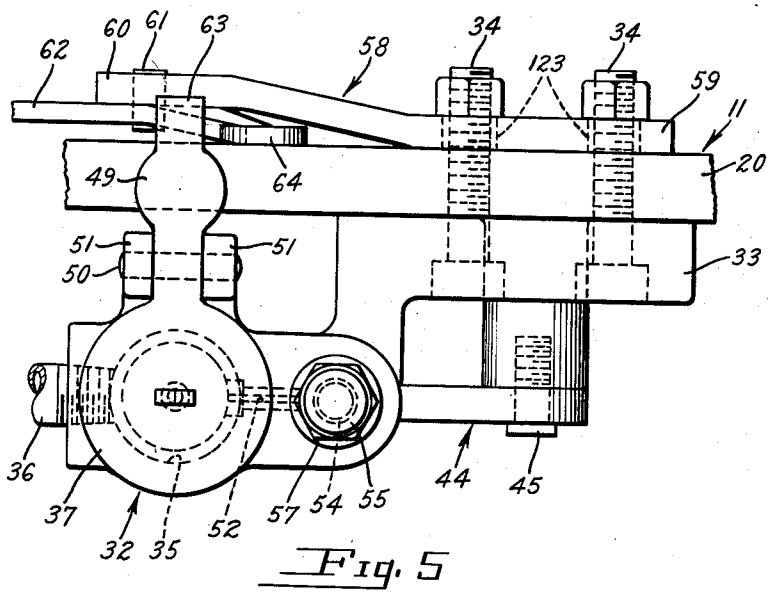


Fig. 5

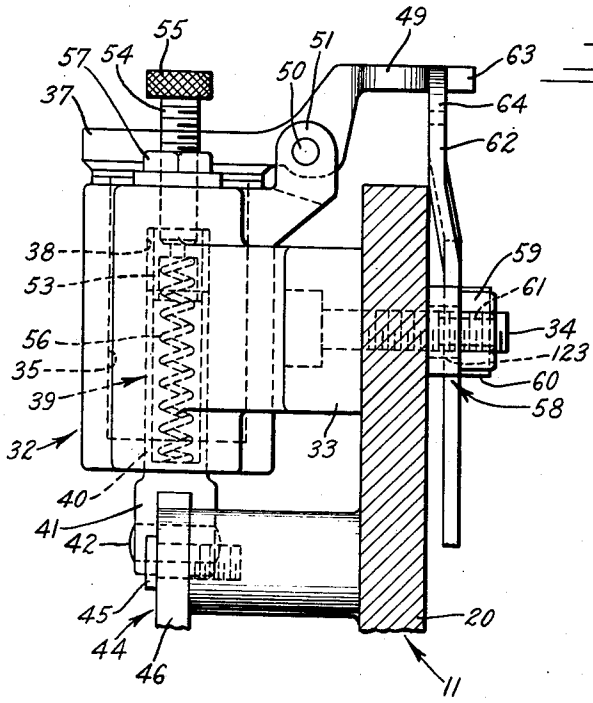


Fig. 6

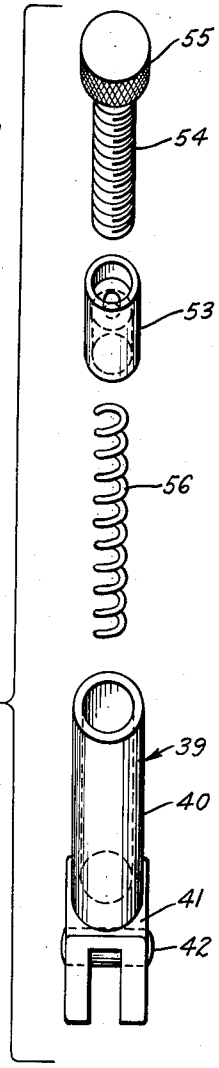


Fig. 7

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Patented Feb. 23, 1954

2,670,203

UNITED STATES PATENT OFFICE

2,670,203

SHEET FEEDER FOR PRINTING PRESSES

John F. Banthin, Bridgeport, Conn.

Application May 25, 1948, Serial No. 29,012

10 Claims. (Cl. 271—26)

1

This invention relates to new and useful improvements in printing presses and has particular relation to improvements in pneumatic valve systems for controlling the feeding of paper sheets to a printing press and simultaneously controlling the impression cylinder for the "on" and "off" positions.

An object of the invention is to provide improvements in the printing press disclosed in my Patent Number 2,592,998, such improvements including means whereby on failure of the vacuum suckers of the press to deliver a sheet of paper to the impression cylinder and thereby on failure of the vacuum system, the impression cylinder will be held against movement toward the type bed or toward "on" position whereby application of ink to the cylinder blanket is prevented.

Another object is to provide in a press of the character indicated means whereby when the vacuum system has been exposed to atmosphere to cause the suckers to deposit a sheet of paper or other material to be printed upon the vacuum system may be maintained open or exposed to atmosphere until the suckers have retreated to any desired position remote from the point of deposit of the sheet or other material to be printed upon whereby the reapplication of suction to said suckers will not occur during any time in which they are adjacent the point of deposit of the sheet or other material and thus cannot cause movement or disarrangement of said sheet.

Other objects and advantages of the invention will become apparent from a consideration of the following detailed description taken in connection with the accompanying drawings wherein a satisfactory embodiment of the invention is shown. However, it is to be understood that the invention is not limited to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention and the scope of the appended claims.

In the drawings:

Fig. 1 is a side elevational view of the rear portion of a press showing the means of the present invention incorporated in the press, the parts being positioned for the vacuum suckers to remove a sheet from a stack;

Fig. 2 is an enlarged side elevational view showing certain of said parts particularly concerned with the invention, the parts being positioned as when a sheet has just been delivered to the impression cylinder;

Fig. 3 is a view somewhat similar to Fig. 2 but showing the parts with the impression cylinder

2

locked in "off" position and with the vacuum suckers substantially returned to pick-up position;

Fig. 4 is a view on a further enlarged scale, the same being partly in side elevation and partly in vertical section and showing certain details of construction;

Fig. 5 is a top plan view of the parts of Fig. 4;

Fig. 6 is an end elevational view of said parts, the view being taken as looking from the right in Fig. 5; and

Fig. 7 is an exploded view in isometric of certain parts of the valve structure.

Referring in detail to the drawings, at 10 is generally indicated a printing press, but a portion of the same being shown, the type bed and the like parts comprising no part of the present invention being omitted. The press 10 comprises a cast base or frame 11 on which the various parts are mounted, such parts including an impression cylinder 12, mounted as between brackets 13, and a feeder table or support 14 for a stack 15 of paper, cardboard or the like to be printed. The feeder table is equipped with front guides 15a and with other required guides (not shown), all as is usual in the art.

The present invention is concerned with certain improvements in the structure of a system or means for retaining the impression cylinder 12 in elevated or "off" position at such times as the delivery mechanism may fail to deliver a piece of paper or the like during operation of the press. In this respect, the present invention is specifically an improvement on the structure disclosed in my above identified application.

In the normal cycle of operation of the press, a feeding mechanism delivers a piece of paper to the impression cylinder where it is gripped as the cylinder moves downwardly to have the paper engaged by the type when the latter moves under the cylinder during each cycle of the machine's operation. Thus, when the feeder mechanism fails to deliver a sheet of paper and the machine proceeds through its normal cycle, the type will engage the impression blanket on the cylinder inking such blanket and thereafter the next sheet of paper will have an offset transfer on its reverse side as it takes up ink from the impression blanket.

To avoid this, the impression blanket must be changed. According to the present invention, improved means are provided whereby when during a cycle of the machine's operation the feeder mechanism fails to deliver a sheet to the impression cylinder, the latter is retained in its

upper or inoperative or "off" position and its blanket will not be engaged by the type as the type bed is carried under the cylinder in the usual manner.

A second important feature of the present invention is the providing of means whereby when the vacuum to the vacuum suckers has been broken in the normal operation of the machine to cause said suckers to release and deliver a sheet of paper or other material to be printed upon to the head stops and the grippers of the impression cylinder, such vacuum system may be maintained broken or open to atmosphere until the vacuum suckers have made the desired part of their return movement.

Thus, with the present improvement, when the vacuum to the vacuum suckers has been broken it is not re-established until after said vacuum suckers are remote from the point of delivery of the sheet or the like whereby when the vacuum is re-established through such vacuum suckers there will be no possibility of the vacuum acting through the suckers causing them to again pick up the delivered sheet or to disturb it or in any way bring about its disarrangement. This second feature is accomplished by a very simple addition to the mechanism already employed and designed for the locking of the impression cylinder in its upper or "off" position at such times as above referred to.

The locking of the impression cylinder in its upper or "off" position at such times as heretofore mentioned is controlled by the suction used in the paper or other sheet or the like feeder or transfer mechanism. Such mechanism, as here shown, includes feeder brackets 16 and a pair of arms 17 (of which but one is shown) mounted on aligned pivots 19 supported in the opposite side wall portions 20 of the base or frame casting 11. At their upper ends arms 17 are connected by a manifold 21 which supplies a vacuum to vacuum suckers 22 through tubular flexible connections 23.

Suction is applied to the manifold from a pump 24 driven by a motor 25 as through a belt 26 and a pulley 27. From the pump a pipe 28 leads to a T-fitting 29, one branch of which is connected with a vacuum gage 30 and to the outer branch of which is connected a pipe or tube 31 leading to a valve body 32 mounted on one of the frame sides 20. Valve body 32 is shown as cast with a lug-like extension 33 through which are passed bolts or similar means 34 for mounting the valve body on the frame side 20. It is noted that the valve body is so mounted that its upper edge is about flush with the upper edge of said frame side.

Valve body 32 (see particularly Fig. 4) includes a chamber 35 opening through the upper side of the valve body and with which communicates the pipe 31. A nipple 36 also communicates through the side wall of the valve body with the chamber 35 and conveniently this nipple is located directly above the connection of the tube 31 with the valve body. Thus, through the chamber 35 the pipe 31 is in communication with the nipple 36.

Normally closing the upper open end of the chamber 35 is a pivotally mounted valve lid 37. When this valve lid is in closed position it serves to prevent the breaking of vacuum within the chamber 35. Also, valve body 32 has a cylindrical chamber 38 opening through its lower end to one side of the chamber 35 and operable in said chamber is a plunger 39 which is held in an inner position when vacuum is applied to the chamber.

The plunger includes a cylindrical upper or inner portion 40 and below such portion carries a head 41 provided with a pin 42 operating between the jaws of a bifurcated arm portion 43 of a substantially L-shaped catch device 44. Device 44 is pivoted at 45 and has its other arm 46 notched whereby to provide it with a shoulder 47, the purpose of which will later appear. The pump 24 is equipped with a petcock 48 which may be used as will be described.

Rigid with or integral with the lid 37 is a lever-like extension 49 and the part comprising the lid and this extension is pivotally mounted as on a pin 50 passing through ear-like extensions 51 of the valve body. Clearly, the part comprising the lid and the extension 49 are eccentrically mounted on the pivot 50 whereby through the forces of gravity the lid will normally occupy a closed position with respect to the open upper end of the chamber 35.

The inner or upper portion of the cylinder or cylindrical chamber 38 of the valve body 32 is in communication with the chamber 35 of said valve body through a metering orifice 52. Within the inner upper portion of said chamber 38 is a short cylindrical sleeve 53 of a diameter to telescopically enter the cylindrical portion 40 of the plunger 39 and which sleeve comprises a floating bearing abutting the inner end of a manually adjustable screw 54 passing through the upper end of the valve body 32 and having a knurled head 55 for use in adjusting the screw.

At its upper end, entering the sleeve 53 and bearing against the same but for the most part located within the cylindrical portion 40 of the plunger 39, is a coil spring 56 which at its respective ends bears against the sleeve and the plunger and normally tends to shift the plunger downwardly or outwardly of the cylinder or chamber 38. Clearly, on turning of the screw, the sleeve 53 may be adjusted downwardly to increase the compression of the spring 56 and preferably lock nut 57 is provided for securing the screw against any accidental movement.

Located in the side frame wall or side 20 is a strip-like bracket 58 shown as secured in place by the bolts 34 used for mounting the valve body 32. The bracket 58 includes an anchor portion 59 which is held flat against the frame side 20 and then includes an outwardly offset portion 60 located in parallel spaced relation to said frame side. A suitable pivot 61 serves to pivotally mount a latch device 62 on the bracket portion 60 in a location between said bracket portion and a tongue-like extension 63 of the lid extension 49. Clearly, the pivot 61 is intermediate the ends of the latch 62.

At its upper end the latch 62 includes a hook-like portion 64 adapted to pass over the mentioned extension 63 when the latter is depressed (as will be set forth) from its normal position such as that in which it is shown in Fig. 6. A coil spring 65 anchored to the frame side 20 at one end and at its other end to a lower portion of latch 62, normally tends to urge such latch about its pivot 61 in a manner or in a direction to carry its hook 64 over the extension 63. However, under normal conditions (that is, when the lid 37 is closed maintaining vacuum in the system) an edge only of extension 63 is engaged by the hook 64 as clearly illustrated in Figs. 4 and 6 so that the latch is unable to move over the extension under the influence of the spring 65. The purpose of all of this structure will be fully set forth hereinafter.

Extending upwardly from the nipple 36 is a tube of rubber or other flexible material 66 which at its upper end communicates with the interior of the manifold 21. At spaced points this tube is clipped to the arm 17 as at 67. From the above, it will be understood that when the pump 24 is operating, a suction is created through the line 31 and within the chamber 35 and through the metering orifice 52 into the cylindrical chamber 38 and through the pipe or tube 66 and the manifold 21 to the vacuum suckers 22. The suction applied through the metering orifice 52 is applied to the inner end of the plunger 39 and when the lid 37 is closed and the suckers 22 are holding a piece of paper or are otherwise sealed, the suction in the cylinder 38 is sufficient to maintain the plunger 39 in an inner position.

The manifold 21 is actually supported by arms 68 of levers which are pivoted at their inner ends as at 69 to the outer ends of the arms 17. Each of these levers includes a second arm 70 to the rear end of which are pivotally connected the upper ends of a rod 71, which rod also passes through guide lugs 72 on the arms 17. Coil springs 73 on the respective rods 71 between one lug 72 and a shoulder or nut 74 normally bearing against said nut, tend to shift the rods 71 whereby to rock the pivoted levers and cause their arms 68 to swing downwardly or clockwise about the pivots 69.

Extensions 75 from the feeder brackets 16 pivotally mount a feed plate 76 at its ends carrying rigid forwardly projecting extensions 77 which at their outer ends, in positions over the cylinder 12, support head stops 78. The pivot for the feed plate 76 is indicated 76a. Extensions 75 have pivoted to their outer ends short arms 79, the left one of which is pivotally connected to the upper end of a link 80, the lower end of which is pivoted to the arm of a bell crank 81. This bell crank is operated by means (not shown) conventional in the art for rocking the arms 79 to have a roller 82 thereon engage the feeder plate 76 and elevate it and thereby the head stops 78 as from the position of Fig. 1 to a position further spaced from the impression cylinder 12.

The lower end of the feeder arm 17 is provided with a crank-like extension 17a to the outer end of which is pivotally connected a link 83. The lower end of said link is pivotally connected to an arm 84 of a rocker 85 pivoted intermediate its ends as at 86 and at the outer end of its second arm 87 carrying a roller 88 located in the cam groove 89 of a cam 90. Cam 90 is mounted on a shaft 91 also mounting a gear 92 and which gear is meshed with a gear 93 on a shaft 94 carrying a cam 95.

These gears 92 and 93 are driven in any suitable manner (not shown) and as the cam 90 rotates, the rocker arm 85 is rocked up and down about the shaft 86 and through the link 83 and crank arm 17a causes shifting of the feeder mechanism and particularly the suckers 22 from a pick-up or loading position as shown in Fig. 1 to a drop-off position over the impression cylinder 12 and adjacent the head stops 78 and then back to the pick-up or loading position.

In Fig. 2, the inclination of the arm 17 indicates that the suckers are approximately in drop-off or delivery position. During the mentioned forward movement of the suckers, a sheet of paper is carried from the stack 15 and at the end of such forward movement is delivered to the head stop or drop guides and thence to the grippers (not shown) of the impression cylinder 12.

The impression cylinder 12 is mounted on an

eccentric 96 located about a shaft 97 mounting a gear 98 which is driven in a suitable manner (not shown) whereby the impression cylinder is driven ni synchronism with movement of the type bed (not shown). Clearly, turning of the eccentric 96 in one direction or the other will raise or lower the impression cylinder 12 and when the latter is raised, it will be in "off" position spaced from the type bed. When the cylinder is lowered, it is in "on" position and then carries a sheet of paper and presses the latter against the type as the type bed is moved under the cylinder whereby to print on the sheet.

After the type bed passes under the cylinder and makes its impression, the cylinder is raised and the type bed passed back to its normal or starting position. The eccentric 96 is fast to an arm 99 to the outer end of which is pivotally connected a link 100. Said link is connected to a similar link 101 by means of a rod 102 and link 101 is pivoted at 103 to one branch of a cylinder trip arm 104, which latter is pivoted toward one end as at 105. Cylinder trip arm 104 includes a latching extension 106 designed to cooperate with the shoulder 47 of the L-shaped catch device 44 previously described.

Pivotally connected with the trip arm 104 is a link 107 to which is connected a rod 108 passing through a pivoted guide 109. A coil spring 110 is mounted on this rod 108 between the guide 109 and a collar 111 and is constantly thrusting against the collar tending to rock the trip arm 104 in a clockwise direction about the pivot 105. A link 112 is pivoted as at 113 to the trip arm 104 and as at 114 to an arm 115 of a bell crank lever 116, which latter is pivoted at 117 and includes a second arm 118 carrying a roller 119 bearing against the cam 95. Clearly, the link 112 is connected with the trip arm 104 in advance of the pivot 105 of the latter. Therefore, on certain movement of the link 112, as toward the left in Figs. 1 and 2, the trip arm 104 is rocked from the position of Fig. 1 through that of Fig. 2 to the position of Fig. 3.

Mounted on the arm 17 of the feeder mechanism is a stud 120 through which is threadedly adjustable a screw 121 designed to engage a trip lever comprising the extension 49 of the valve or lid 37 and rock the same as from the position of Figs. 1 and 3 to the position of Fig. 2 whereby to tilt the lid 37 off the valve body 32 and break and maintain broken the vacuum in the chamber 35 and thus in those parts of the system at the side of said chamber remote from the pump 24. It will be apparent that the screw 121 is movable with the transfer mechanism from the loading position shown in Fig. 1 to a delivery or discharge position, such as is partly illustrated in Fig. 2. In this latter position, the arm 17 of the transfer mechanism is so positioned that the screw 121 has engaged the lever-like extension 49 and caused lifting of the lid 37 from the valve body 32 opening the suction system to atmospheric pressure.

As the lever-like extension 49 is depressed, rocking about the pivot 50 and causing raising of the lid 37 to open position, the tongue-like extension 63 is also depressed or moved downwardly to such extent that the spring 65 succeeds in rocking the latch 62 about the pivot 61 in a counterclockwise direction so as to dispose the hook portion 64 of said latch over said tongue-like extension 63. Thus, as the transfer mechanism comes into position to deliver a sheet of paper or the like to the head stops 78 and thus

to the impression cylinder, the screw 121 engaging the extension 49 causes movement of the lid 37 to open position breaking the vacuum to the vacuum suckers 22 whereby to release the sheet that is to be printed upon.

At the same time, the latch 62 is swung into operative position over the extension 63 latching the lid 37 in open position. Thus, at the start of the return movement of the transfer mechanism, as the screw 121 moves away from the extension 49, the lid 37 is held in open position so that there is no suction on the suckers 22. In former devices where the suction systems become operative immediately on the start of the return movement of the transfer mechanism, there was a possibility that suction through the suckers 22 might cause them to pick up a dropped sheet or cause movement or disarrangement of the sheet. However, with the present device, as the transfer mechanism starts back to pick-up or loading position, the latch 63 retains the lid 37 in open position so that the vacuum system is interrupted between the pump 24 and the vacuum suckers 22 and there is no possibility of the suction through said suckers causing movement or disarrangement of the dropped or delivered sheet.

As the transfer mechanism approaches its loading or pick-up position (see Fig. 3) the pivot 122 between the outer end of the arm 17a and the link 63 is moving upwardly as from the position of Fig. 2 through the position of Fig. 3 toward the position of Fig. 1. As such pivot approaches the position of Fig. 3 it engages the lower end portion of the latch 62 and causes swinging of said latch on the pivot 61 in a clockwise direction, against the tendency of the spring 65, whereby to rock such latch into a released position with respect to the extension 63 whereupon the lid 37 falls into closed position over the chamber 35. At this time, the vacuum system being again closed, suction is again applied to the vacuum suckers 22 whereby they may take the next sheet from the stack 15.

When the apparatus is in use, the vacuum gage 30 serves to indicate and adjust the real vacuum needed for different sizes, types and weights of paper to be fed by the feeder mechanism. The petcock 48 at the vacuum pump is used only occasionally, as may be required, for adjusting the vacuum in the suckers 22 and the plunger 39 to compensate for differences in the weight of the paper as when feeding very light tissue or oil skin paper in the feeder or transfer mechanism at one time and heavy cardboard at another time.

With the above understanding, assuming that adjustments have been made whereby the proper degree of vacuum will be applied for handling of the stack 15 to be printed upon, the machine is started. For the present we will assume that the operation is started from the position of Fig. 1. There the suckers will pick up the top sheet of paper (customarily means are employed for providing a blast of air against the front edges of the stock in line parallel with the stock so as to separate the upper sheets from the pile).

It will be understood that the full suction pressure will be applied through the suckers 22 since the valve lid 37 is closed. As the cam 90 rotates it rocks the arm 85, the feeder mechanism carrying the sheet of paper is rocked in a clockwise direction, on the pivots 19, carrying the sheet of paper from the stock pile to the impression cylinder. While the sheet is retained by the suckers 22, the vacuum remains sealed in the described system or pipe line and the sheet is carried forward to the head stops 78. The leading edge of the sheet is just ahead of the suckers and such edge of the sheet is brought against the head stops.

At this point in the movement of the feeder or transfer mechanism, the screw 121 engages the extension 49 and actuates the same to tilt the lid 37 to open position breaking the vacuum in the system. Since the screw 121 is mounted directly on the arm 17 of the feeder mechanism, it is possible to make a direct and accurate setting as to the point of release of the sheet by the suckers and such point may be at any desired place forwardly of the head stops 78.

Here it is noted that the extension 49 projects inwardly of the machine frame and over the upper edge of the frame side 20. Thus, but a short stud or lug 120 on the side arm 17 is required for the mounting of the screw 121. Therefore, this screw is conveniently mounted in a rigid manner and is located close to the other moving parts of the machine and does not extend therefrom in any such manner as to be in the way or to be likely to spring or yield unless mounted with very heavy parts.

When the lid 37 is raised and the vacuum in the system broken, the vacuum at the suckers 22 is lost and the latter drops the sheet of paper or the like at the head stops. The breaking of the vacuum also allows the plunger 39 to drop in the cylindrical chamber 38 in the valve body as from the position of Figs. 1 and 2 to the position of Fig. 3, permitting of a corresponding movement of the cylinder locking lever or latch device 44.

Then in the normal cycle of operation of the machine, the feeder mechanism moves back toward the stock pile after a very short movement, screw 121 is out of the way, and away from the extension 49. However, the lid 37 may not gravitate to closing position since the hook 64 of the latch 63 is now over the extension 63 rigid with said lid and so is securing the lid in open position. Therefore, there is no vacuum applied through the suckers 22 in any such manner as to cause movement or disarrangement of the sheet which has just been released or dropped.

However, as the return movement of the transfer or feeder mechanism continues, the pivot 122 engages the lower portion of the latch 62 rocking the same in a clockwise direction to remove its hook 64 from the above extension 63 whereupon lid 37 gravitates to closed position. Therefore, when the suckers get back to the stack of paper and engage a sheet, the vacuum has been reestablished in the system and the suckers grip or pick up the paper or sheet and the plunger 39 is again raised in the cylindrical chamber 38 by the suction applied to the upper end of said plunger through the orifice 52.

The feeder mechanism may now move forward to deliver a new sheet of paper to the impression cylinder. With respect to the time of operation of the latch 62 to released position with respect to the extension 63, it is noted particularly with respect to Fig. 5, that the flat portion 59 of the bracket 58 has elongated openings 123 through which the bolts 34 pass. Thus, this bracket may be longitudinally adjusted slightly to dispose the latch in slightly different positions for engagement by the pivot 122 at slightly different times. This permits of operation of the latch to release the lid in a choice of positions after the transfer mechanism has travelled the desired predetermined distance on its return journey.

If, for any reason, the sheet of paper is not retained or held by the suckers, as the feeder mechanism moves from the pick-up or loading position toward the impression cylinder or the delivery position, the vacuum in the system is broken due to the leakage of atmosphere through the suckers. This being true, the plunger 39 in the valve body 32 drops or has dropped to the lower position in which it is shown in Fig. 3. While the cam 90 is operating to move the feeder mechanism as described, the cam 95 acting on the roller 119 also acts on the trip arm 104 and it will be understood that the spring 110 is constantly pressed to shift said trip arm.

During each cycle of operation of the machine, the cam 95, as its high point is approached, acting on the roller 119 rocks the bell crank 116 in a counterclockwise direction and through the link 112 forces the trip arm 104 from the position of Fig. 1 to the position of Fig. 3. When these parts are positioned as in Fig. 1, the spring 110 has acted to cause an upward thrust through the rod or bar 102 rocking the eccentric 96 and lowering the impression cylinder 12 whereby paper on the cylinder will be engaged by the type.

Then as the high point of the cam rocks the bell crank in a counterclockwise direction, the trip arm 104 is rocked also in a counterclockwise direction against the tendency of the spring 110 thereby shifting the eccentric 96 in the opposite direction to raise the impression cylinder to an "off" or inoperative position. As this occurs, the latch portion 106 of the trip arm is carried to a lower position and after the vacuum system has been broken as when the suckers are not carrying a piece of paper, the plunger 39 has been permitted to drop, the L-shaped locking lever or catch device 44 shifts or rocks in such a manner that the latch part 106 enters under the shoulder 47 of such catch device or lever whereby the tripping lever 104 is locked down to the position of Fig. 3 with the impression cylinder 12 in its upper or "off" position.

Thus, while under these circumstances the suckers may have failed to deliver a piece of paper to the impression cylinder, the blanket of the latter will not become soiled from ink from the type since the impression cylinder is locked in its upper or "off" position. In the normal use of the machine when the suckers drop the sheet against the head stops 78, the trip arm 104 has already moved to a position wherein its latch portion 106 is above a position in which it may be engaged by the catch device 44. At such time the printing cylinder or impression cylinder is in its "on" or impression position and the sheet of paper is taken by the cylinder grippers (not shown) and revolved with the cylinder for the printing operation. Thereafter, the printed paper is taken by the delivery grippers (not shown) and delivered to a pile.

With the present mechanism, since the cylinder will be locked in "off" position when the suckers 22 fail to carry a sheet of paper, it will be apparent that the type bed will not accidentally print on the cylinder blanket. Should such happen, the blanket would offset print upon the backs of the next sheets following the accidental operation and thereby spoil such following sheets. Since, with the present mechanism, the impression cylinder will be locked in its "off" or non-printing position whenever the suckers fail to carry a sheet of paper toward the cylinder, no damage to the cylinder blanket will occur and in the regular operation of the machine the feeder or transfer mechanism will return to the stock pile, pick up a sheet of paper and bring it over to the cylinder and the operations will be carried on as usual.

It will be appreciated that there will be no damage to any part when the impression cylinder is locked in "off" position since the entire movement of the cylinder to "on" or printing position is brought about by the spring 110 and the press locking mechanism merely functions to prevent such spring from performing its function when the suckers fail to carry a sheet during their movement toward the impression cylinder.

In the present construction, it will be noted that I have succeeded in eliminating a number of parts employed in the construction disclosed in my application above identified. Thus, in the present construction I have but a single valve body mounting the plunger 39 and in which the vacuum is broken by movement of the lid 37. Then I have succeeded in eliminating a number of parts and their necessary installation and connections. Further, in the present structure, the vacuum to the suckers 22 is taken through the chamber 35 and the fixed orifice 52 places such chamber in communication with the chamber 38 in which the plunger 39 is movable. Thus, I do not tap off a connection between the chamber 35 and the chamber 38 in order to supply a vacuum to the suckers.

In addition, the present construction provides means whereby the suction is not reapplied to the suckers until they are a safe distance from their delivery position so there is no danger of the reapplied suction causing any movement or disarrangement of the previously delivered sheet. It will be understood that as the delivery mechanism is returning from delivery to pick-up position, should the suction be reapplied to the suckers too soon and while they are in the immediate vicinity of the newly deposited sheet, they might again pick the sheet up and carry it away, or might shift it out of proper relation to the stops and the grippers of the cylinder.

Having thus set forth the nature of my invention, what I claim is:

1. In a printing press including a fixed frame, an impression cylinder carried by said frame, feeder means movable on said frame to transfer a sheet from a pile to said cylinder and to return to said pile, suckers carried by said feeder means, a system for applying suction to said suckers, a valve in said system fixedly mounted on said frame and openable to break the vacuum therein short of said suckers, said valve including a movable valve opening and closing part, means carried by said feeder means engageable with said movable valve part for opening said valve when said feeder means reaches a position to have said suckers deposit a sheet on said cylinder, movable means mounted on said frame to secure said movable valve part in open position, and means carried by said feeder means to shift said securing means to release said movable valve part for closing on predetermined return movement of said feeder means.

2. In a printing press including an impression cylinder, feeder means to transfer a sheet from a pile to said cylinder and to then return to said pile, said means including suckers, a system for applying suction to said suckers, a valve in said system and openable to break the vacuum therein short of said suckers, an adjustable screw carried by said feeder means for opening said valve

when said feeder means reaches a desired position to have said suckers deliver a sheet to said cylinder, securing means to secure said valve in open position when it has been moved to such position by said adjustable screw, means to shift said securing means to release said valve for closing at the end of a predetermined return movement of said feeder means, and means adjustably mounting said securing means whereby the point in the return movement of said feeder means at which said securing means is moved to release said valve may be varied.

3. In a printing press including an impression cylinder, a feeder means to transfer a sheet from a pile to said cylinder and to return to said pile, said means including suckers, a system for applying suction to said suckers, a valve in said system and including a valve body adapted to be opened to atmosphere and a pivoted lid normally closing said valve body, an extension on and rigid with said lid and pivoted whereby to be rocked in one direction to raise said lid and open said valve body to atmosphere to break the suction in said system at a point short of said suckers, means carried by said feeder means and operable to engage and rock said extension in said direction to open said lid to break the suction in said system and have said suckers deposit a sheet on said cylinder, means to engage said extension and secure said valve in open position, and means to shift said securing means to release said extension to permit of closing of said valve on predetermined return movement of said feeder means from said delivery position.

4. In a printing press including an impression cylinder, a feeder means to transfer a sheet from a pile to said cylinder and to return to said pile, said means including suckers, a system for applying suction to said suckers, a valve in said system and including a valve body adapted to be opened to atmosphere and a pivoted lid normally closing said valve body, an extension on and rigid with said lid and pivoted whereby to be rocked in one direction to raise said lid and open said valve body to atmosphere to break the suction in said system at a point short of said suckers, means carried by said feeder means and operable to engage and rock said extension in said direction to open said lid to break the suction in said system and have said suckers deposit a sheet on said cylinder, securing means to engage said extension and secure said valve in open position, means to shift said securing means to release said extension to permit of closing of said valve on predetermined return movement of said feeder means from said delivery position, and means adjustably mounting said securing means whereby the point in the return movement of said feeder means at which said securing means is moved to release said valve may be varied.

5. In a printing press including a frame and sheet feeding mechanism comprising suckers, a pivoted arm for moving said suckers from a sheet receiving station to a sheet delivery station, means for rocking said arm on its pivot to shift said suckers from said receiving station to said delivery station and back to said receiving station during each cycle of the machine's operation, a system for applying suction to said suckers, a normally closed valve in said system shiftable to open the system to atmosphere and render said suckers ineffective to hold a sheet, means on said arm movable therewith and located to engage and open said valve on each movement of the arm carrying said suckers to delivery position, a latch on said machine frame spring biased to engage said valve when the latter is in open position and retain it open, and means whereby on a predetermined return movement of said arm carrying said suckers to their receiving position said latch is engaged and shifted against the action of said spring releasing said valve for closing.

6. In a printing press including a frame and sheet feeding mechanism comprising suckers, a pivoted arm for moving said suckers from a sheet receiving station to a sheet delivery station, means for rocking said arm on its pivot to shift said suckers from said receiving station to said delivery station and back to said receiving station during each cycle of the machine's operation, a system for applying suction to said suckers, a pivotally mounted normally closed valve rockable on its pivot to an open position opening said system to atmosphere and rendering said suckers ineffective to hold a sheet, means on said arm movable therewith and located to engage and rock said valve to open position on each movement of the arm carrying said suckers to delivery position, a latch pivoted on said machine frame spring biased to move and engage said valve when the latter is rocked to open position and retain it open, and means whereby on a predetermined return movement of said arm carrying said suckers to their receiving position said latch is engaged and rocked against the action of said spring releasing said valve for rocking back to closed position.

7. In a printing press including a frame and sheet feeding mechanism comprising suckers, a pivoted arm for moving said suckers from a sheet receiving station to a sheet delivery station, means for rocking said arm on its pivot to shift said suckers from said receiving station to said delivery station and back to said receiving station during each cycle of the machine's operation, a system for applying suction to said suckers, a normally closed valve in said system and shiftable to open the system to atmosphere and render said suckers ineffective to hold a sheet, means on said arm movable therewith and located to engage and open said valve on each movement of the arm carrying said suckers to delivery position, a latch on said machine frame spring biased to engage said valve when the latter is in open position and retain it open, and said latch when in position retaining said valve open having a portion in the path of return movement of said arm whereby on a predetermined return movement of said arm carrying said suckers to their receiving position said arm engages said latch portion and shifts the latch against the action of said spring releasing said valve for closing.

8. In a printing press including a frame and sheet feeding mechanism comprising suckers, a pivoted arm for moving said suckers from a sheet receiving station to a sheet delivery station, means for rocking said arm on its pivot to shift said suckers from said receiving station to said delivery station and back to said receiving station during each cycle of the machine's operation, a system for applying suction to said suckers, a pivotally mounted normally closed valve rockable on its pivot to an open position opening said system to atmosphere and rendering said suckers ineffective to hold a sheet, means on said arm movable therewith and located to engage and rock said valve to open position on each movement of the arm carrying said suckers to delivery

position, a latch pivoted on said machine frame spring biased to move and engage said valve when the latter is rocked to open position and retain it open, and said latch when in position retaining said valve open having a portion in the path of return movement of said arm whereby on a predetermined return movement of said arm carrying said suckers to their receiving position said arm engages said latch portion and rocks the latch against the action of said spring releasing said valve for closing.

9. The press as in claim 5 wherein the means on said arm and movable therewith comprises a screw longitudinally adjustable relative to said arm whereby to open said valve in the selected position of said arm in its movement toward delivery position.

10. In a printing press including a frame and sheet feeding mechanism comprising suckers, a pivoted arm for moving said suckers from a sheet receiving station to a sheet delivery station, means for rocking said arm on its pivot to shift said suckers from said receiving station to said delivery station and back to said receiving station during each cycle of the machine's operation, a system for applying suction to said suckers, a normally closed valve in said system shiftable to open the system to atmosphere and render said suckers ineffective to hold a sheet, means for opening said valve on predetermined movement of said arm carrying said suckers to delivery

position, a spring biased latch positioned to engage said valve when opened and retain it open, and said latch when in position retaining said valve open having a portion in the path of return movement of said arm whereby on a predetermined return movement of said arm carrying said suckers to their receiving position said arm engages said latch portion and shifts the latch against the action of said spring releasing said valve for closing.

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