Oct. 15, 1929. J. H. McELROY 1,731,633

SHEET CALIPERING MECHANISM

Filed Jan. 3, 1927 4 Sheets-Sheet 1

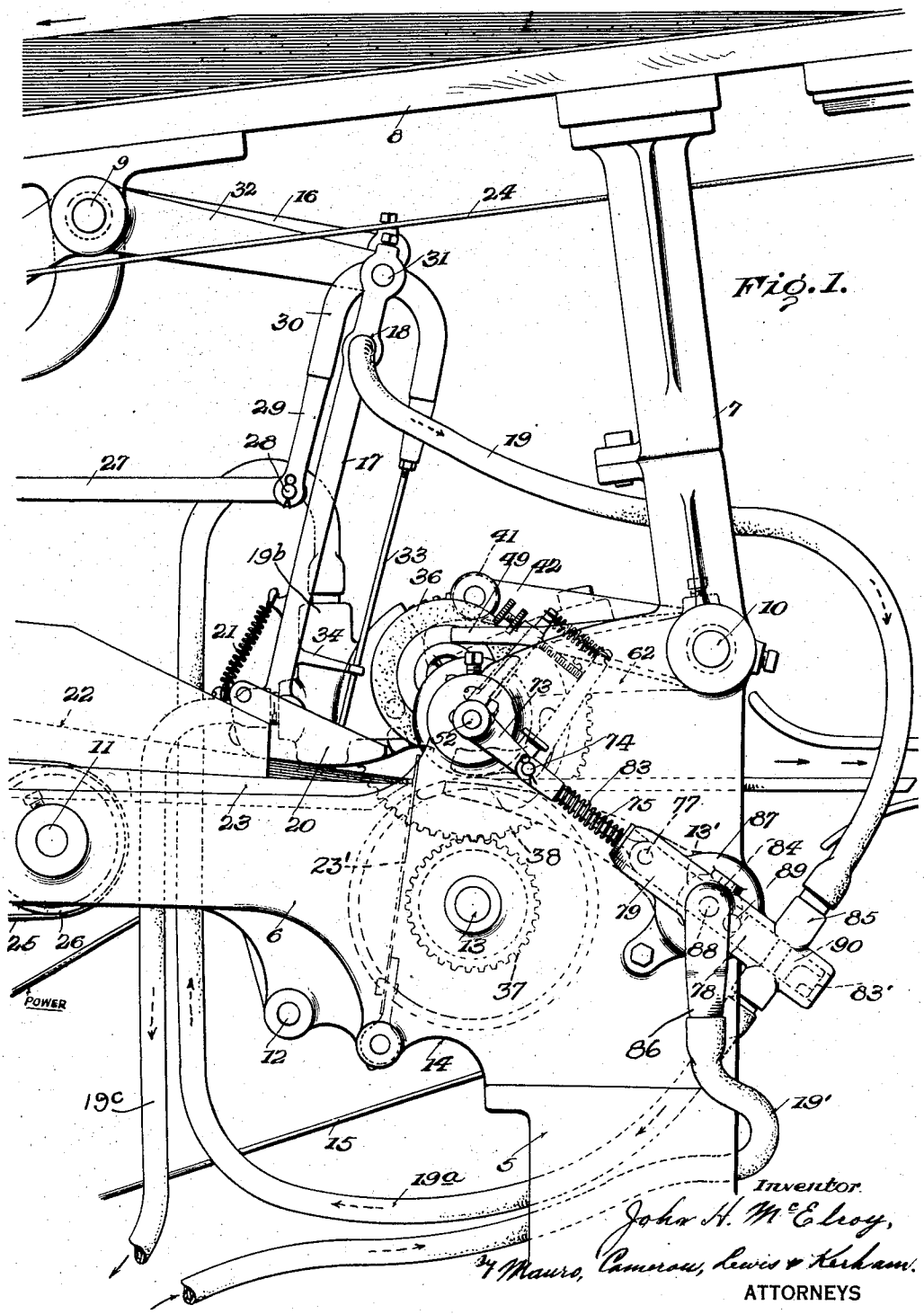


FIG. 1.

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SHEET CALIPERING MECHANISM

Filed Jan. 3, 1927 4 Sheets-Sheet 2

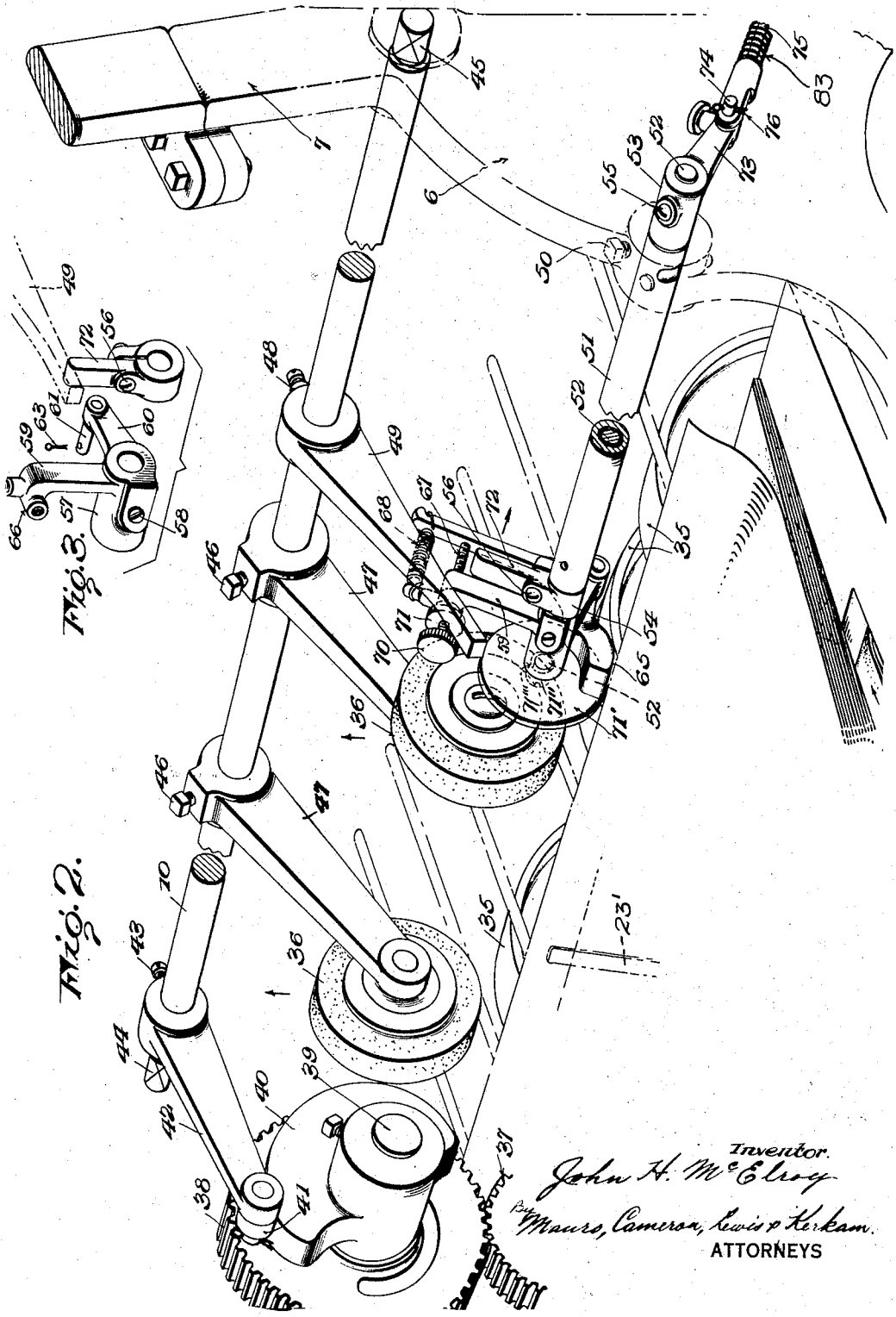


Fig. 2.

Fig. 3.

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SHEET CALIPERING MECHANISM

Filed Jan. 3, 1927 4 Sheets-Sheet 3

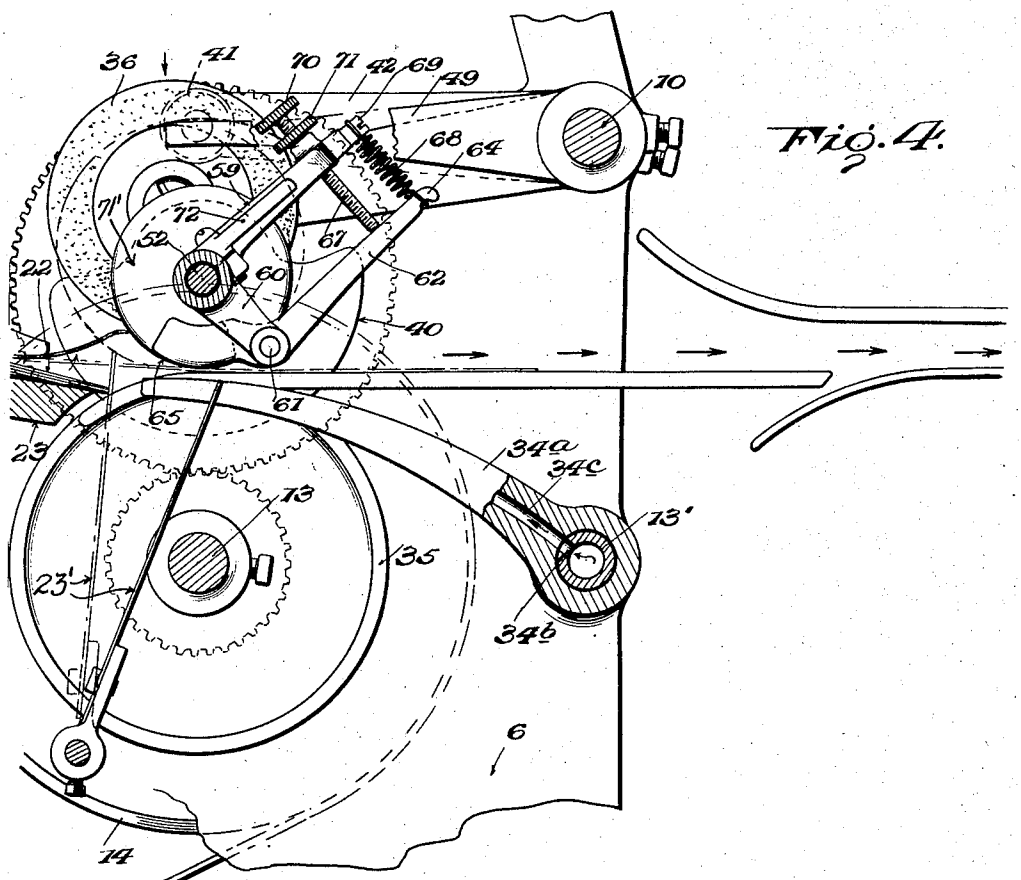


Fig. 4.

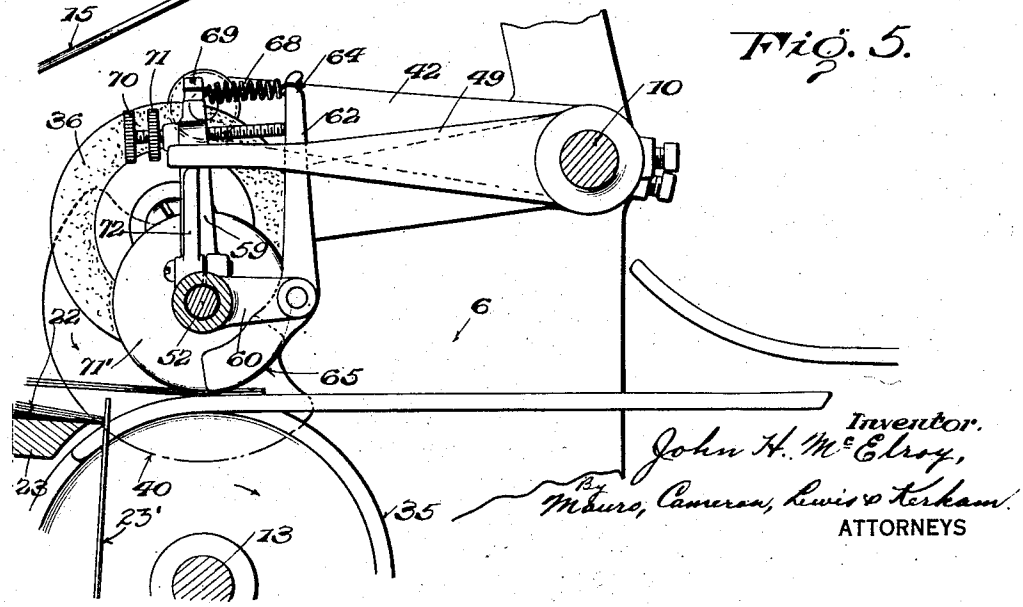


Fig. 5.

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SHEET CALIPERING MECHANISM

Filed Jan. 3, 1927 4 Sheets-Sheet 4

Fig. 6.

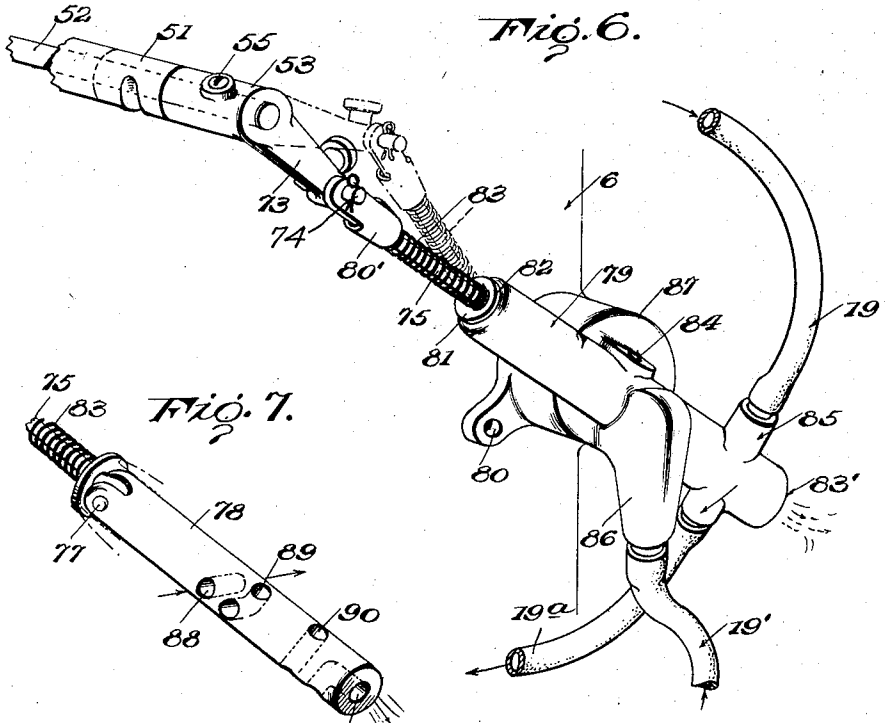


Fig. 7.

Fig. 8.

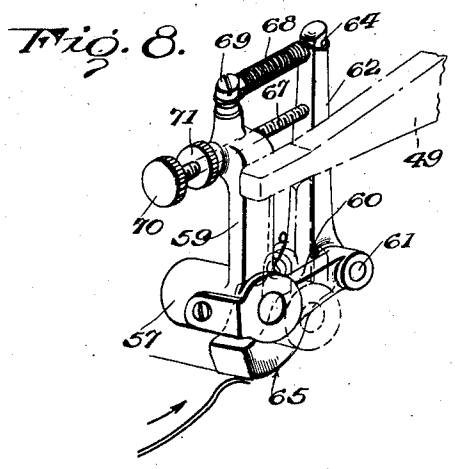
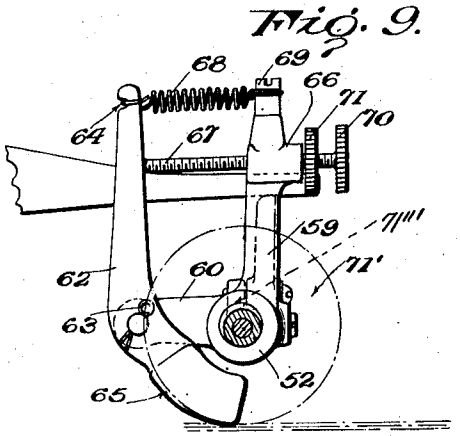


Fig. 9.



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UNITED STATES PATENT OFFICE

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SHEET-CALIPERING MECHANISM

Application filed January 3, 1927. Serial No. 158,695.

This invention relates to sheet feeding machines and more particularly to calipering mechanism to be employed in such machines, but adapted for use in any association where such a mechanism is desirable.

The principal objects of this invention are to provide a sheet calipering mechanism which prevents the simultaneous feeding of more than one sheet or thickness of material; which is adjustable to facilitate its use in calipering sheets of different thicknesses and varying surface areas; which, by cutting off the suction in a sheet forwarding device or the like, automatically renders said device inoperative when sheets become jammed or more than one sheet is fed by said device; which, when more than one sheet is fed at the same time, automatically throws out of operation means such as drop rollers or the like for delivering the sheets from the machine; which is automatically reset upon removal of the jammed or additional sheets, thereby connecting the forwarding device with the source of suction and at the same time restoring the operation of the drop rollers; and which is an inexpensive, efficient and expeditious mechanism for calipering sheets fed to printing presses or any other instrumentality.

This invention will be better understood by reference to the accompanying drawings which illustrate one embodiment of the inventive idea and wherein—

Fig. 1 is a side elevation of part of a sheet feeding machine, showing calipering mechanism of the present invention installed therewith;

Fig. 2 is a detail perspective view of the calipering mechanism shown in Fig. 1, parts of the sheet feeding machine being omitted for purposes of clearer illustration;

Fig. 3 is a perspective detail view of a portion of the caliper adjusting means, the parts being separated for purposes of clearer illustration;

Fig. 4 is an enlarged side elevation of the calipering mechanism, showing the position occupied by the same during normal feeding of the sheets;

Fig. 5 is a view similar to Fig. 4, showing the caliper in tripped position when a jam occurs or when more than one sheet is advanced to the caliper by the feeder or forwarding mechanism;

Fig. 6 is a perspective detail view of caliper operated means for controlling suction in the sheet feeder or forwarding mechanism;

Fig. 7 is a similar view of a valve forming part of the means shown in Fig. 6;

Fig. 8 is a detail perspective view similar to Fig. 3, showing the caliper and its adjusting devices in tripped position when a plurality of sheets are advanced by the feeder or forwarding mechanism; and

Fig. 9 is a side elevation of the caliper and associated parts, showing the position occupied by the caliper when it is tripped by said plurality of sheets.

Referring to the drawings, wherein like reference characters designate like parts throughout the several views, the caliper mechanism and associated sheet feeding devices are mounted on a suitable framework including at each side thereof a vertical support or leg 5, an upper side frame member 6, and a bracket 7 for supporting an upper feed board 8. This framework is connected together by shafts 9, 10, 11, 12, 13 and 13′, the shaft 13 having fixed thereon a pulley 14 around which passes a belt 15 driven from an electric motor or other suitable source of power (not shown).

The sheet feeding mechanism may be of any suitable construction, but said mechanism is preferably comprised by a sheet forwarder, a sheet separator, and rollers for delivering the sheets from the forwarder and separator to the press or other device to be fed. The sheet forwarded preferably includes a bell-crank mounted on the shaft 9 and one arm 16 of which has pivotally mounted thereon the upper end of a hollow tubular swinging support 17. This tubular support has connected therewith at 18 one end of a suction pipe 19, and the lower end of said support carries a pivotally mounted suction shoe 20 on the rear portion of which is connected one end of a coil spring 21. The opposite end of the spring

21 is connected with the hollow tubular support 17 in any suitable manner and said spring serves, during swinging motion of the support 17, to periodically rock the shoe 20 which separates and forwards sheets successively from a pile or bank 22 of the same supported on the lower feed board 23. The sheets are fed from the upper feed board 8 to the lower feed board 23 by belts 24 and 25, the belt 25 passing around a pulley 26 fixed on the shaft 11 which is driven by suitable mechanism (not shown) to impart motion to the belt 25 and feed the sheets forwardly to the shoe 20. In one cycle of operation of the sheet forwarding shoe 20, the latter and the support 17 are successively elevated, advanced, retracted and lowered, and this is accomplished by a cam operated link 27, the forward end of which is pivotally connected at 28 with an arm 29 projecting downwardly from an inverted U-shaped yoke or frame 30 pivotally mounted at 31 on the forward arm of a bracket 32 mounted on the shaft 9. The forward part of the yoke or frame 30 carries a rod or pin 33 which passes through an apertured guide 34 on the swinging support 17 and engages a part of the pivotally mounted shoe 20. It will thus appear that as motion is imparted to the bell-crank 16, and the link 27, said elements will act to successively raise, advance, retract and lower the tubular support 17 and shoe 20 in one cycle of operation of the parts. Suction is automatically created and broken periodically in the shoe 20 by any suitable means so that when said shoe is lowered, the sheet is engaged therewith and advanced forwardly by the shoe to feed and drop rollers hereinafter described. The suction is then broken in the shoe and the sheet is released therefrom, whereupon said shoe is lifted, retracted and lowered to engage and forward the next sheet. The sheet forwarder per se forms no part of this invention, and the description and illustration of this device is merely incidental to the association therewith of the present calipering mechanism.

The device for airing the sheets consists of a nozzle 34^a mounted on the stay-shaft 13′ and through which air is delivered toward the sheets 22 on the feed board 23, to separate said sheets and facilitate the feeding or forwarding thereof by the shoe 20. The nozzle 34^a is supplied with air by the stay-shaft 13′ which is hollow and provided with a port 34^b for establishing communication between the hollow stay-shaft 13′ and the air discharge passage 34^c of the nozzle.

As the sheets are separated by the air blast of the nozzle 34^a and successively advanced by the sheet forwarding device 20, said sheets pass between feed rollers 35, 35 and drop rollers 36, 36, the latter being raised at certain intervals to provide for movement of the sheets onto the feed rollers, and thereafter lowered and driven by said feed rollers so that the sheets are fed to the press or other instrumentality with which the feeder is associated. The sheets are fed along the feed board 23 into engagement with a stop 23′ (Figs. 1, 2, 4 and 5) which is opeated by suitable means (not shown) to move rearwardly into engagement with the front edges of the sheets when the forwarder 20 is retracted and to move forwardly out of the path of travel of each sheet as the forwarder advances with the same. The forwarder 20 is lowered into engagement with the sheet and advanced to carry it between the feed rollers 35, 35 and the drop rollers 36, 36, the latter at this time being raised. The sheet is then released from the forwarder by breaking of the suction therein whereupon the forwarder is lifted and retracted, the drop rollers 36, 36 are lowered by gravity to engage the sheet with the feed rollers 35, 35, and the latter feed the sheet toward the printing press or other device to be fed. The drop rollers 36, 36 and the feed rollers 35, 35 are operated and driven respectively by the following mechanism. Mounted on one end of the driven shaft 13 is a gear 37 (Figs. 1 and 2) which meshes with a gear 38 carried by a stub shaft 39 journalled in suitable bearings on the framework of the machine. The gear 38 has rigidly secured thereto a cam 40 which engages a roller 41 carried on the free end of an arm 42 the opposite end of which is fixed at 43 on rock-shaft 10. This rock-shaft is journalled at 44, 45 on the side frames of the machine, and said shaft has fixed thereon at 46, 46 a pair of arms 47, 47 on the free ends of which the drop rollers 36, 36 are mounted. It will thus appear that as the gear 38 rotates, the arm 42 will, through the engagement of the roller 41 with the cam 40, rock the shaft 10 so that the arms 47, 47 and the rollers 36, 36 will be periodically raised and lowered as the sheets are fed thereto by the sheet forwarding device. Also fixed on the rock shaft 10, as at 48, is an arm 49 the free end of which is engaged by an element of the sheet calipering mechanism to hold the arm 47, 47 and the arm 42 elevated and prevent operation of the drop rollers 36, 36 when more than one sheet or thickness of material is fed at the same time by the forwarder 20.

Referring now to Figs. 2 to 5 inclusive, 8 and 9, the sheet calipering mechanism is preferably comprised by the following instrumentalities. Mounted on the frame piece 6 and secured at 50 in a suitable opening therein, is a tube 51 in which is journalled a rock-shaft 52. This rock-shaft 52 is prevented from endwise movement in the tube 51 by collars 53 and 54 secured at 55 and 56 respectively to opposite end portions of the rock-shaft 52 projecting from the opposite ends of the tube 51. A bell-crank 57 is ad-

justably secured at 58 on the rock-shaft 52 so that during the normal operation of the sheet feeding mechanism, one arm 59 of said bell-crank is inclined to the longitudinal vertical plane of the rock-shaft 52. The other arm 60 of the bell-crank is normally disposed in angular relation with the horizontal plane of the rock-shaft 52 and carries on its free extremity a pin 61. A calipering member 62 is pivotally mounted on the pin 61 and retained in position thereon by a cotter key 63. This calipering member is preferably in the form of a lever provided at its upper end with a notch 64 and at its lower end with a curved shoe or calipering portion 65 the nose of which is directed toward the advancing edges of the sheets on the feed board 23. In order to adjust the calipering lever 62 for sheets varying in thickness, the bell-crank arm 59 is provided with an apertured threaded boss 66 through which is threaded an adjusting screw 67 which engages the uper end of the calipering lever 62. The calipering lever is maintained in its adjusted position against the end of the screw 67 by a coil spring 68 one end of which is connected with said lever in the notch 64, the opposite end of the spring being secured to the upper part of the bell-crank arm 59 by a screw 69. The adjusting screw 67 is provided with a head 70 for turning the screw, and with an adjusting nut 71 for locking the screw in position after the adjustment of the calipering member 62 has been made. It will thus appear, that the shoe or calipering portion 65 is raised or lowered with respect to one of the feed rollers 35, 35 in accordance with the direction of rotation of the screw 67, and that the caliper can be adjusted with respect to said feed roller to provide clearance for a single sheet of material of any desired thickness.

During the normal operation of the calipering mechanism, the bell-crank 57 and the caliper lever 62 stand in the inclined positions shown in Figs. 2 and 4, so that sheets aerated by the nozzle 34ª and forwarded singly and successively by the shoe 20 past the calipering member 65, may pass singly in succession between the feed rollers 35, 35 and drop rollers 36, 36 to the press or other instrumentality to be fed. As the single sheets are fed in succession past the calipering member, said sheets, if turned up at their forward edges, are guided and the forward edges thereof prevented from engaging the end of the calipering member, by a disk 71′, or the like, rotatably mounted at 71″ on the rock-shaft 52. The central opening 71‴ of the disk 71′ is clearly shown in Fig. 2 as having a diameter greater than that of the rockshaft 52, and normally the disk 71′ is supported from said shaft so that said disk and the caliper are spaced equal distances from the adjacent feed roller 35 whereby a single sheet may pass between said feed roller, and the disk 71′ and the caliper member 65. In the event that more than one sheet is fed at the same time by the forwarding shoe 20 to the feed rollers and drop rollers, the disk 71′ is lifted by the plurality of sheets and said sheets engage the calipering member 65 and swing the calipering mechanism in a counterclockwise direction to the substantially vertical position of the parts shown in Fig. 5. This counterclockwise swinging motion of the calipering mechanism serves to throw the drop rollers out of operation, break the suction in the sheet forwarder 20 and cut off the supply of air to the sheet separator 34ª, and these operations are accomplished in the following manner.

Mounted on, or formed integrally with, the collar 54 is a detent 72 which during the normal operation of the machine stands in an inclined position with respect to the longitudinal vertical plane of the rock-shaft 52. When the calipering mechanism, however, is swung in the counterclockwise direction as above described, this detent 72 engages the free end of the arm 49 and holds this arm, together with the arm 42 and the arms 47, 47 in elevated positions to prevent the operation of the rock-shaft 10 by engagement of the cam 40 with the roller 41 on the free end of the arm 42. It will thus appear that the drop rollers 36, 36 will be prevented from lowering into engagement with the feed rollers 35, 35 until the jammed sheets at the calipering mechanism have been removed and said mechanism restored to its normal position as shown in Figs. 2 and 4.

At the time the drop rollers are thrown out of operation by the calipering mechanism, the latter also acts to break the vacuum or suction in the shoe 20 and prevent the delivering of air into the nozzle 34ª. For this purpose a valve control is interposed between the above-named parts of the sheet feeding mechanism and the calipering mechanism and is operated by the latter, preferably through a yieldable toggle connection which also serves to hold the parts of the calipering mechanism in the inclined position shown in Figs. 2 and 4, during the normal operation of the machine. The collar 53, as above described, is fixed on the rock-shaft 52 at 55, and said collar carries or has formed integrally therewith, a crank arm 73 the free end of which carries a crank pin 74. A link 75 is pivotally connected at one end with the crank pin 74 and retained thereon by a cotter key 76 or other suitable securing means. The opposite end of the link 75 is pivotally connected at 77 with one end of a valve 78 arranged for movement in a valve casing 79 bolted or otherwise suitably secured at 80 to the upper side frame 6 of the machine. The link 75 is provided at one end with an abutment 80′ and has slidably mounted thereon a disk 81 which slidably engages the open end 82 of the valve casing 79.

A coil spring 83, surrounding the link 75 and interposed between the abutment 80′ and disk 81, serves to hold the parts of the calipering mechanism in their normal inclined position, and at the same time yields sufficiently when the caliper is thrown into operation, to provide for straightening of the parts 73 and 75 of the toggle, which movement of these parts produces movement of the valve 78 in the valve casing 79.

The valve casing 79 is provided with two by-passes 83′ and 84 (Fig. 1) which are closed by the valve 78 during the normal operation of the sheet feeding mechanism. The by-pass 83′ provides for communication between the atmosphere and the suction conduit 19 when the valve is operated to break the vacuum in the sheet forwarding shoe 20. The bypass 84 serves to deliver the air from the air delivery conduit 19′ into the atmosphere when the valve 78 is operated to prevent delivery of air into the nozzle 34ª.

The suction conduit 19, as herein shown, is formed in three sections, one end of the section 19, as before described, being connected with the tubular support 17 of the sheet forwarder, and the opposite end of said section being connected with one end of a nipple 85 formed on the valve casing 79 and extending transversely thereof. The second section 19ª of the suction conduit has one end connected with the nipple 85 and the opposite end connected with the nipple 19ᵇ secured to the machine framework. The third section 19ᶜ of the suction conduit has one end connected with the nipple 19ᵇ and its opposite end connected with the suction side of a suitable pump (not shown). The air delivery conduit 19′ is connected at one end with said pump and at the opposite end with a nipple 86 adapted to communicate with the interior of the valve casing 79 and with a hollow part 87 also communicating with the interior of the valve casing and with the passage afforded by the hollow stay-shaft 13′.

The valve 78 is provided with a plurality of ports 88, 89, 90 and 91, the port 88 normally establishing communication between the air delivery conduit 19′ and the hollow stay-shaft 13′, and the port 90 normally establishing communication between the sections 19 and 19ª of the suction conduit and the interior of the sheet forwarding device 17, 20. It will thus appear that when the calipering mechanism is moved in a counterclockwise direction, the same will, through the medium of the above described yieldable toggle connection, move the valve toward the right (Figs. 1 and 6) bringing the ports 89 and 91 into registration with the by-passes 84 and 83′, respectively. The suction in the sheet forwarder is thus automatically broken, the pump drawing in air through the by-pass 83 and section 19ª of the suction conduit, and delivering the air through the air delivery conduit 19′ and the by-pass 84 into the atmosphere instead of into the hollow stay-shaft 13′ and the nozzle 34ª.

From the foregoing it will appear that until the jammed sheets have been removed from the calipering mechanism, the sheet forwarder and the sheet separator, as well as the drop rollers, are rendered inoperative. Upon removal of the jammed sheets from the sheet calipering mechanism, the spring 75 immediately restores the parts of the sheet calipering mechanism and the valve control to the full line positions shown in the drawings, whereupon suction is created periodically in the sheet forwarder and air is delivered into the nozzle, and the normal operation of the machine proceeds as before.

While the particular embodiment of the invention herein shown has been described more or less in detail, it is to be expressly understood that the invention is capable of embodiment in a variety of mechanical expressions within the scope of the appended claims.

What is claimed is:—

1. In an apparatus of the character described, a nozzle through which air is blown to aerate the sheets, a sheet caliper, and caliper operated means for controlling the delivery of air through said nozzle.

2. In an apparatus of the character described, a suction device for feeding sheets, a nozzle, a sheet caliper, and caliper operated means for controlling the suction in said device and the supply of air to said nozzle.

3. In an apparatus of the character described, a nozzle through which air is blown to aerate the sheets, a valve for controlling the delivery of air through said nozzle, a sheet caliper, and means connecting the sheet caliper with the valve for operating the same on movement of the caliper.

4. In an apparatus of the character described, a suction device for feeding or forwarding sheets, a nozzle, a valve controlling the suction in said device and the supply of air to said nozzle, a sheet caliper, and means connecting the caliper with the valve for operating the same on movement of said caliper.

5. In an apparatus of the character described, a sheet feeding roller, a drop roller, mechanism for raising and lowering said drop roller so that the latter is driven periodically by the feed roller, and a sheet caliper arranged to control the operation of said raising and lowering mechanism.

6. In an apparatus of the character described, a suction device for feeding or forwarding sheets, a nozzle through which air is blown to aerate the sheets, a feed roller or the like for delivering the sheets from said suction device, a drop roller, mechanism for raising and lowering the drop roller so that the latter is driven periodically by the feed roller, a sheet caliper, caliper operated means

for controlling the suction in said device and the supply of air to said nozzle, and caliper operated means for controlling the operation of said raising and lowering mechanism.

7. In a sheet feeding mechanism or the like, a nozzle, an air delivery conduit connected with the nozzle and having a by-pass, a valve normally closing the by-pass and establishing communication between the air delivery conduit and the nozzle, a sheet caliper, and caliper operated means causing the valve to open the by-pass and cut off the supply of air to the nozzle when more than one sheet at a time is advanced by the sheet feeder or forwarder.

8. In a sheet feeding mechanism, or the like, a sheet feeder or forwarder, a nozzle, a suction conduit connected with the sheet feeder or forwarder, an air delivery conduit connected with the nozzle, a suction by-pass and an air by-pass disposed in the suction conduit and the air delivery conduit respectively, a valve normally closing the by-passes and establishing communication between the suction conduit and sheet forwarder and the air delivery conduit and the nozzle, a sheet caliper, and caliper operated means causing said valve to open the by-passes, break the suction in the forwarder, and cut off the supply of air to the nozzle, when more than one sheet at a time is advanced by said forwarder.

9. In a sheet feeding mechanism or the like, a valve control for a part of said mechanism, a sheet caliper, and valve operating means interposed between the caliper and the valve and normally holding the caliper in position to provide for the feeding of single sheets in succession past the same.

10. In a sheet feeding mechanism or the like, a valve control for a part of said mechanism, a sheet caliper, and means connecting the caliper with the valve holding the valve and the caliper against movement during the normal operation of the mechanism but adapted to yield and operate the valve when more than one sheet at a time is fed to the caliper.

11. In a sheet feeding mechanism or the like, a valve control for a part of said mechanism, a sheet caliper, a rock-shaft on which the sheet caliper is mounted, and a yieldable toggle connection interposed between the rock-shaft and the valve.

12. In a sheet feeding mechanism or the like, a valve control for a part of said mechanism and including a valve casing provided with a by-pass and a valve in said casing normally closing the by-pass, a rock-shaft, a sheet caliper mounted on the rock-shaft, and a yieldable toggle connection interposed between the rock-shaft and the valve and operated through the caliper to move the valve and open said by-pass.

13. In a sheet feeding mechanism or the like, a valve control for a part of said mechanism, a rock-shaft provided at one end with a crank arm, a sheet caliper mounted on the opposite end of the rock-shaft, and a yieldable toggle pivotally connected with the valve and said crank arm.

14. In a sheet feeding mechanism, or the like, a valve control for a part of said mechanism, a rock shaft provided with a crank arm, a sheet caliper mounted on the rock-shaft in spaced relation with the crank arm, a link pivotally connecting one end of the valve with the free extremity of said crank arm, and a spring interposed between the link and the casing for said valve.

15. In a sheet feeding mechanism or the like, a valve control for a part of said apparatus, a rock-shaft provided with a crank arm, a sheet caliper mounted on said rock-shaft, a link pivotally connected with the valve and the crank arm and provided with an abutment, a disk slidably mounted on the link and movably engaging the casing for the valve, and a spring on the link interposed between said abutment and said disk.

16. In a sheet feeding mechanism or the like, a valve control for a part of said mechanism and comprising a valve casing having a by-pass and a valve in said casing movable therealong and having a port controlling the by-pass and a port controlling communication between the valve casing and said part of the sheet feeding mechanism, a sheet caliper, and caliper controlled means for reciprocating said valve along the valve casing.

17. In a sheet feeding mechanism or the like, a sheet forwarder and a sheet nozzle, a valve control for said devices comprising a casing having a by-pass for the sheet forwarder, a by-pass for the nozzle, and a valve provided with ports controlling the by-passes and communication between the valve casing and the forwarder and nozzle, a sheet caliper, and caliper controlled means for operating said valve.

18. In an apparatus of the character described, a drop roller, mechanism for raising and lowering said roller including a rock shaft, means to rock the shaft and raise and lower the drop roller, an arm on the rock shaft, and a sheet caliper operating when more than one sheet at a time is fed thereto to engage said arm and prevent the lowering of the drop roller.

19. In an apparatus of the character described, a drop roller, a driven cam, a rock-shaft carrying said drop roller and having means normally engaged by said cam to raise and lower the drop roller, a caliper engaging element on the rock shaft, and a sheet caliper operating when more than one sheet at a time is fed thereto, to hold said element in an elevated position and prevent said means from following the cam to lower the drop roller.

20. In an apparatus of the character de-

scribed, a rock-shaft, a drop roller mounted thereon, rock-shaft actuating means cam operated in one direction and gravity operated in the opposite direction, to raise and lower the drop roller respectively, an arm carried by said rock shaft, a sheet caliper, and a caliper operated element for holding said arm in an elevated position to prevent gravity operation of said means and lowering movement of the drop roller.

21. In a sheet calipering mechanism, a movable shaft or the like, a caliper member carried by said shaft, and means normally holding the shaft and caliper member in position so that single sheets may be fed in succession past the latter.

22. In a sheet calipering mechanism, a rock-shaft, a sheet caliper fixed thereon, and means normally holding said shaft and the caliper in position so that single sheets may be fed in succession past the latter, said means being adapted to yield so that the rock-shaft and caliper may move to prevent the simultaneous feeding of a plurality of sheets.

23. In a sheet calipering mechanism, a rock-shaft, or the like, a bell-crank fixed on said rock-shaft, a caliper member pivotally mounted on one arm of the bell-crank, and means interposed between the other arm of the bell-crank and the caliper member for adjusting the latter.

24. In a sheet calipering mechanism, a rock-shaft, a bell-crank fixed on said rock-shaft, a caliper member pivotally mounted on one arm of said bell-crank, and a spring connecting the other arm of the bell-crank with an arm of said caliper member.

25. In a sheet calipering mechanism, a rock-shaft, a bell-crank fixed on said rock-shaft, a caliper member pivotally mounted on one arm of the bell-crank, a yieldable connection between the other arm of the bell-crank and an arm of the caliper member, and an adjusting screw interposed between said last-named arm of the bell-crank and the caliper member.

26. In a sheet calipering mechanism, a stationary tubular shaft, a rock-shaft rotatably mounted therein, a bell-crank fixed on said rock-shaft, a caliper member pivotally mounted on one arm of the bell-crank, and means interposed between the other arm of the bell-crank and an arm of said caliper member for adjusting the latter with respect to said last named bell-crank arm.

27. In a sheet calipering mechanism, a rocking caliper element, and means normally holding said element in an inclined position to provide for the feeding of single sheets in succession past the same, said means being adapted to yield so that the caliper element may move to a substantially vertical position and prevent the feeding of more than one sheet at a time.

28. In a sheet calipering mechanism, a rocking lever provided at one extremity thereof with a curved calipering portion, and yieldable means normally holding said lever in an inclined position so that single sheets may be fed in succession past the curved caliper portion, said means providing for movement of the lever to a substantially vertical position whereby the curved calipering portion is lowered to prevent the simultaneous feeding of a plurality of sheets.

29. In a sheet calipering mechanism, a bell-crank, a lever pivoted intermediate its ends on one arm of said bell-crank and provided at one extremity with a curved calipering portion, and means interposed between the other arm of the bell-crank and the opposite extremity of said lever for adjusting the latter with respect to the last named bell-crank arm.

30. In a sheet calipering mechanism, a rock-shaft, a bell-crank fixed thereon, a sheet calipering lever pivotally mounted intermediate its ends on one arm of said bell-crank, means interposed between the other arm of the bell-crank and the upper end of the calipering lever for adjusting the latter with respect to the last named bell-crank arm, and means normally holding said devices in an inclined position so that single sheets may be fed in succession past the lower end of the calipering lever, said holding means being adapted to yield whereby the devices may move to a substantially vertical position and prevent the simultaneous feeding of a plurality of sheets.

In testimony whereof I have signed this specification.

JOHN H. McELROY.