

Nov. 20, 1928.

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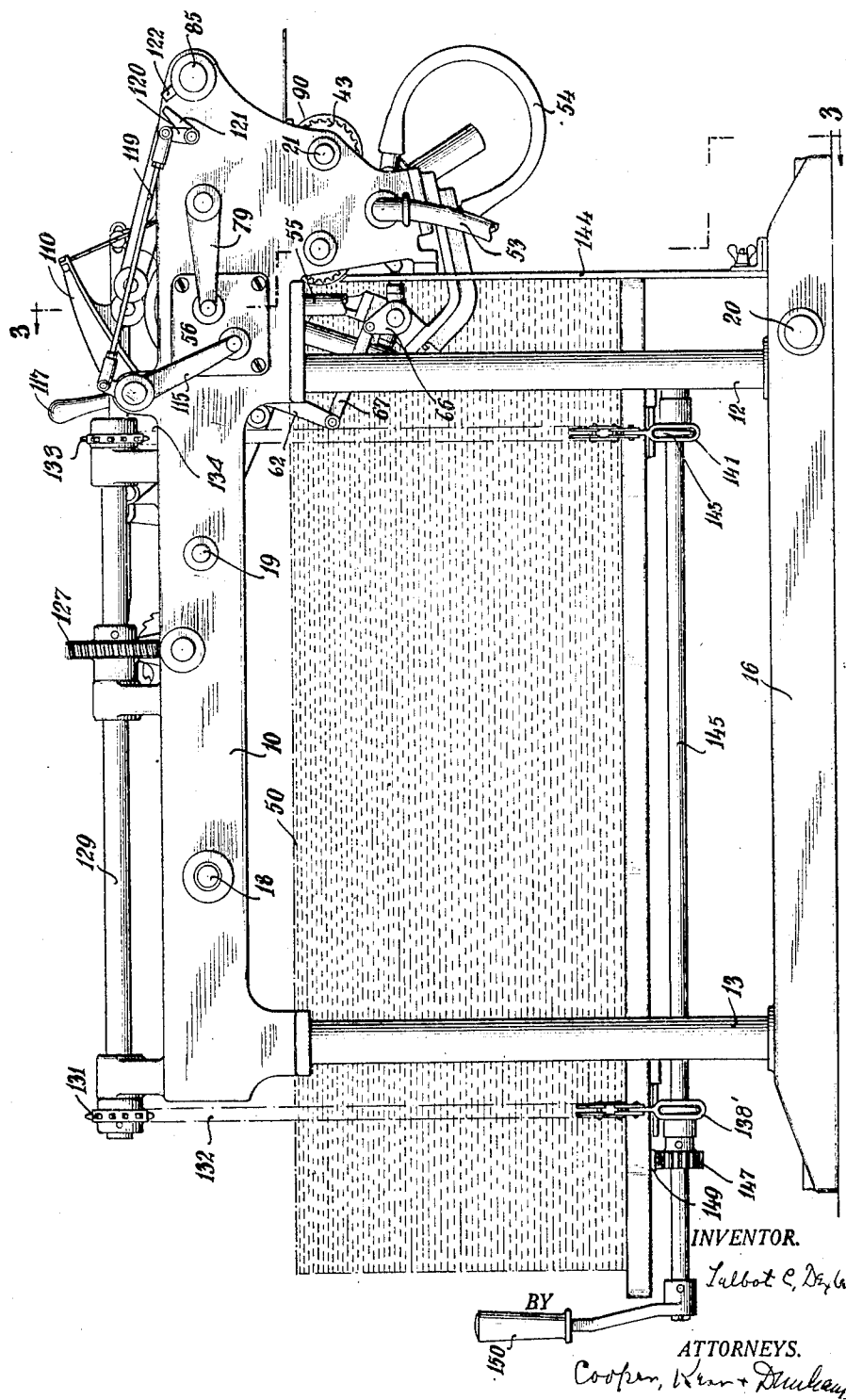
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PAPER FEEDING MACHINE

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13 Sheets-Sheet 1

Fig. 1



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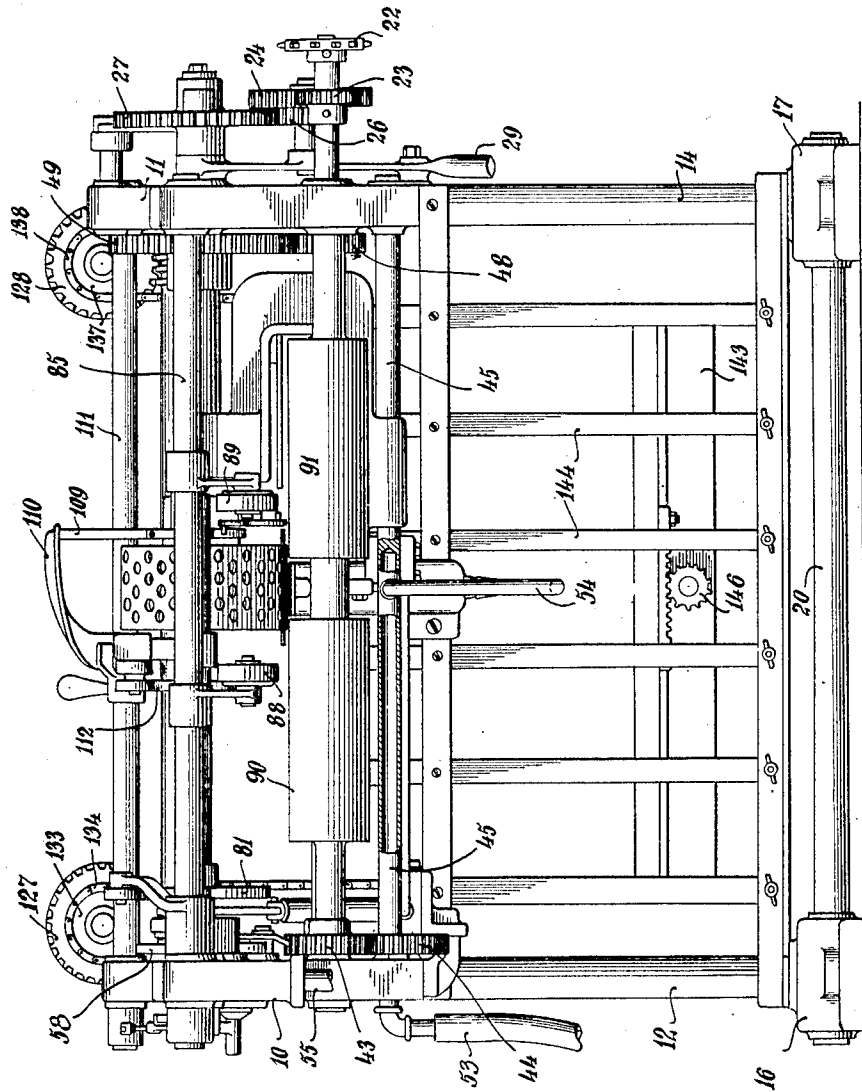
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13 Sheets-Sheet 2

Fig. 2



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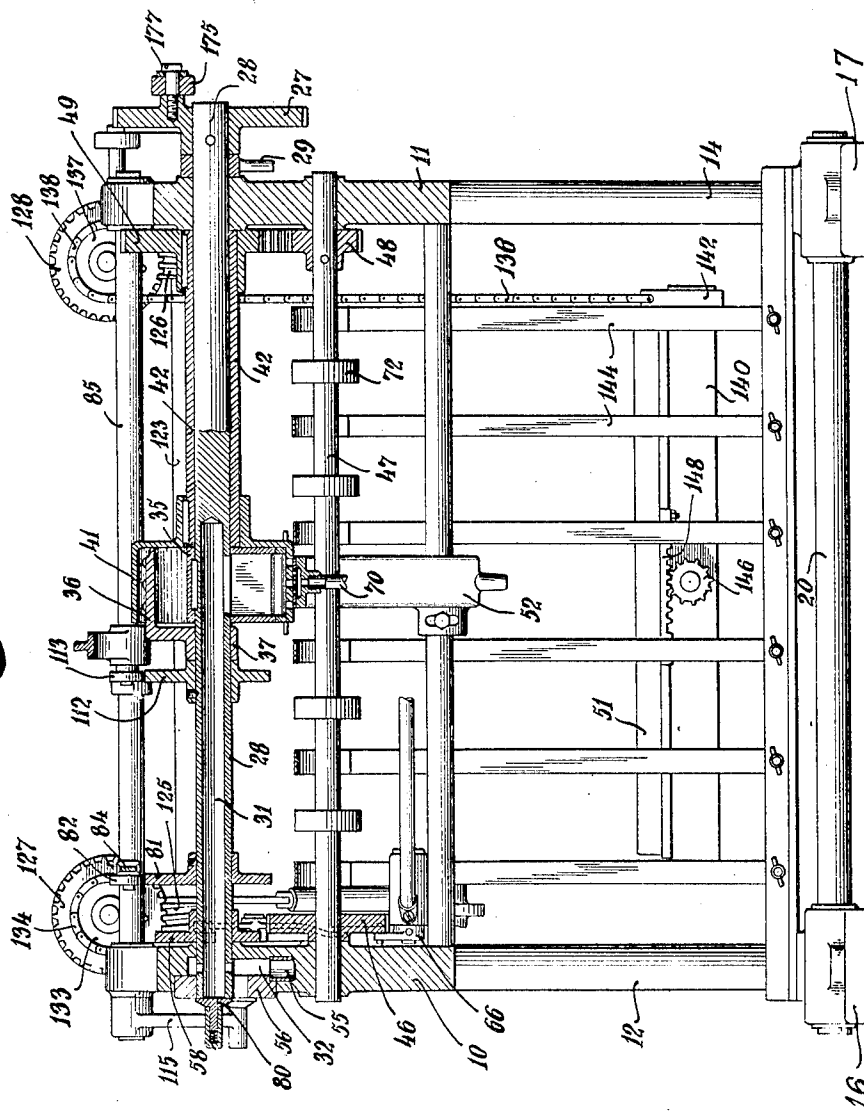
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13 Sheets-Sheet 3

Fig. 3



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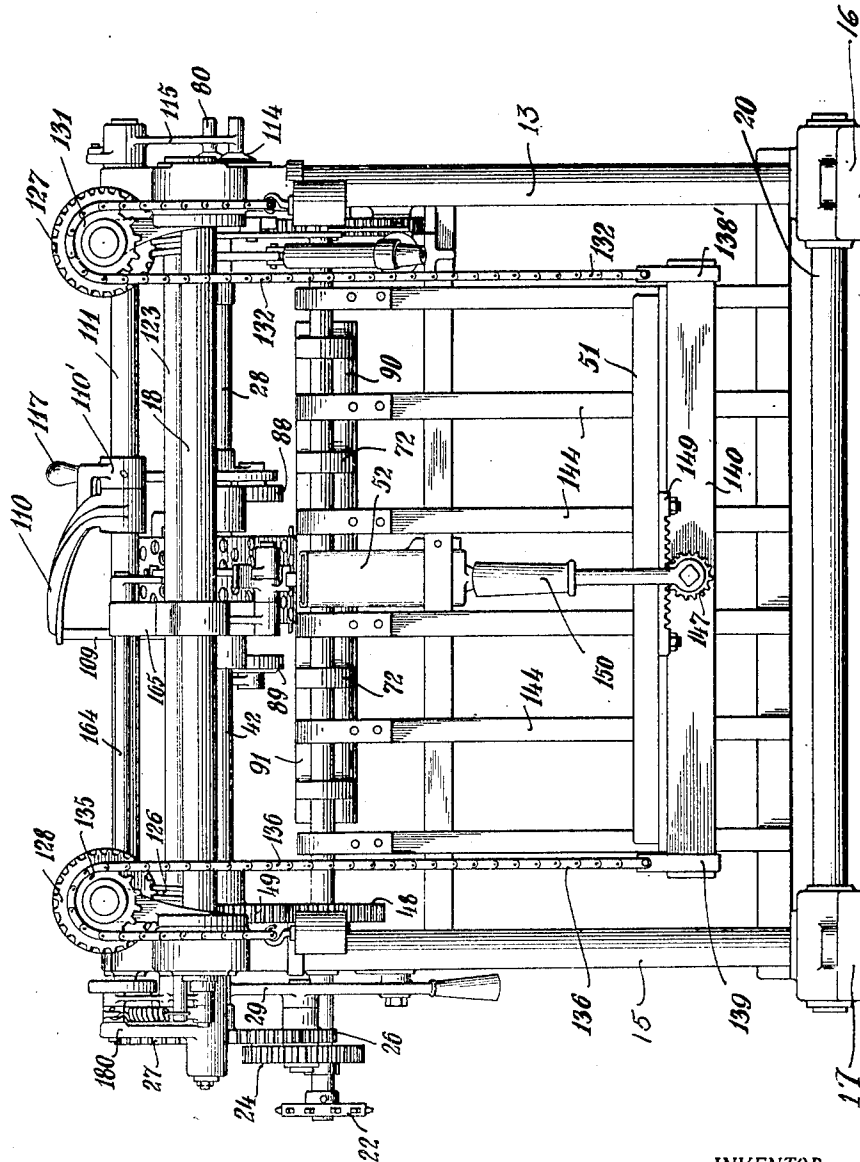
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13 Sheets-Sheet 4

Fig. 4



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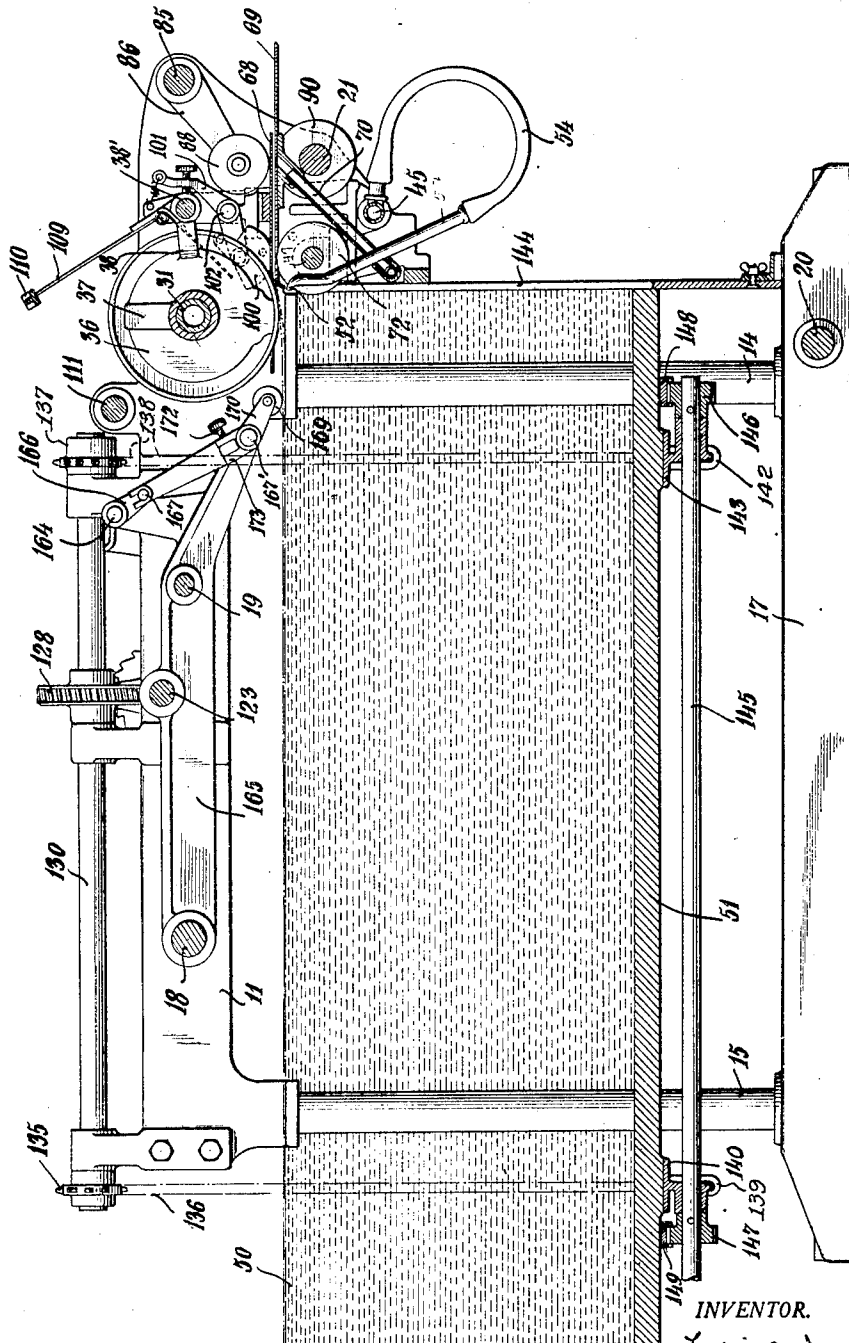
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13 Sheets-Sheet 6

Fig. 6



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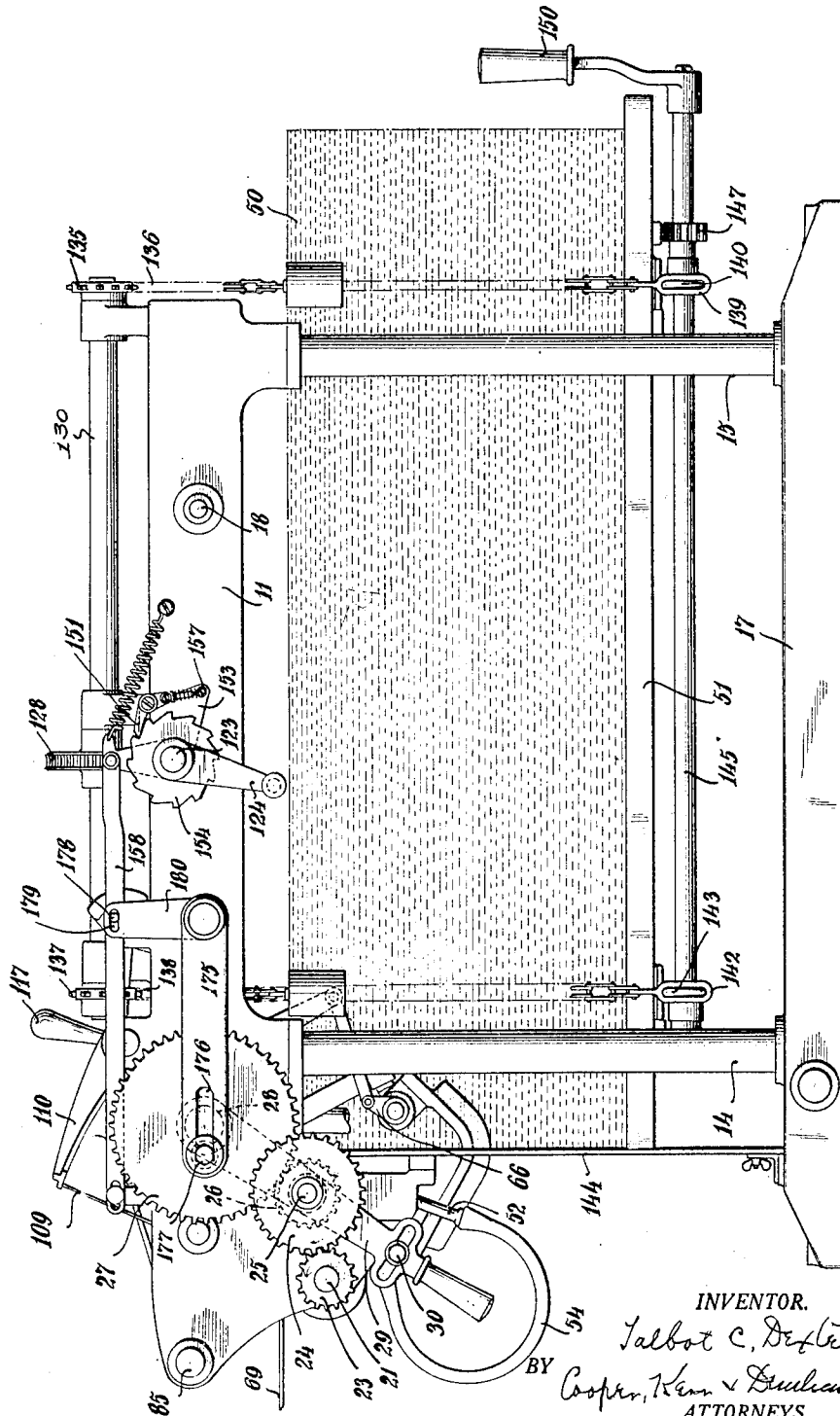
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13 Sheets-Sheet 7

Fig. 7



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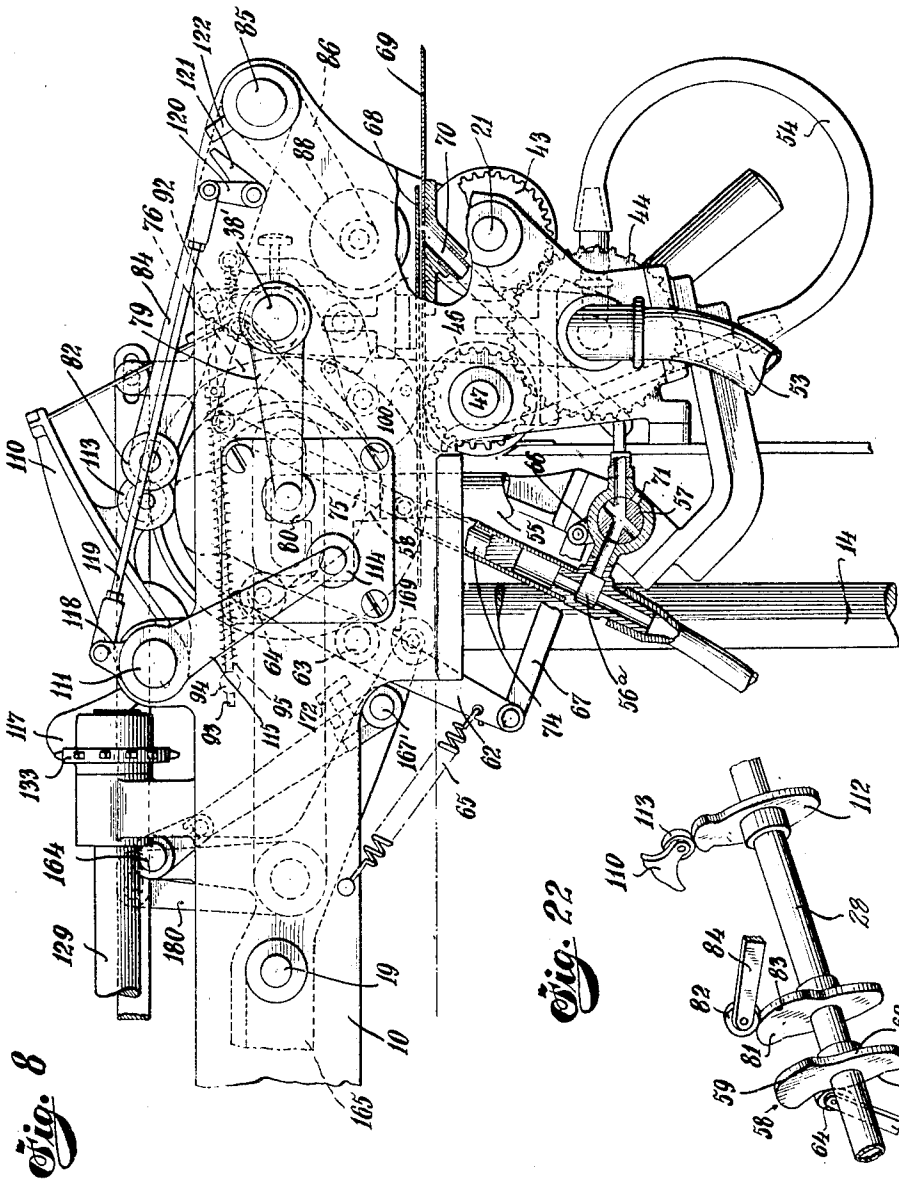
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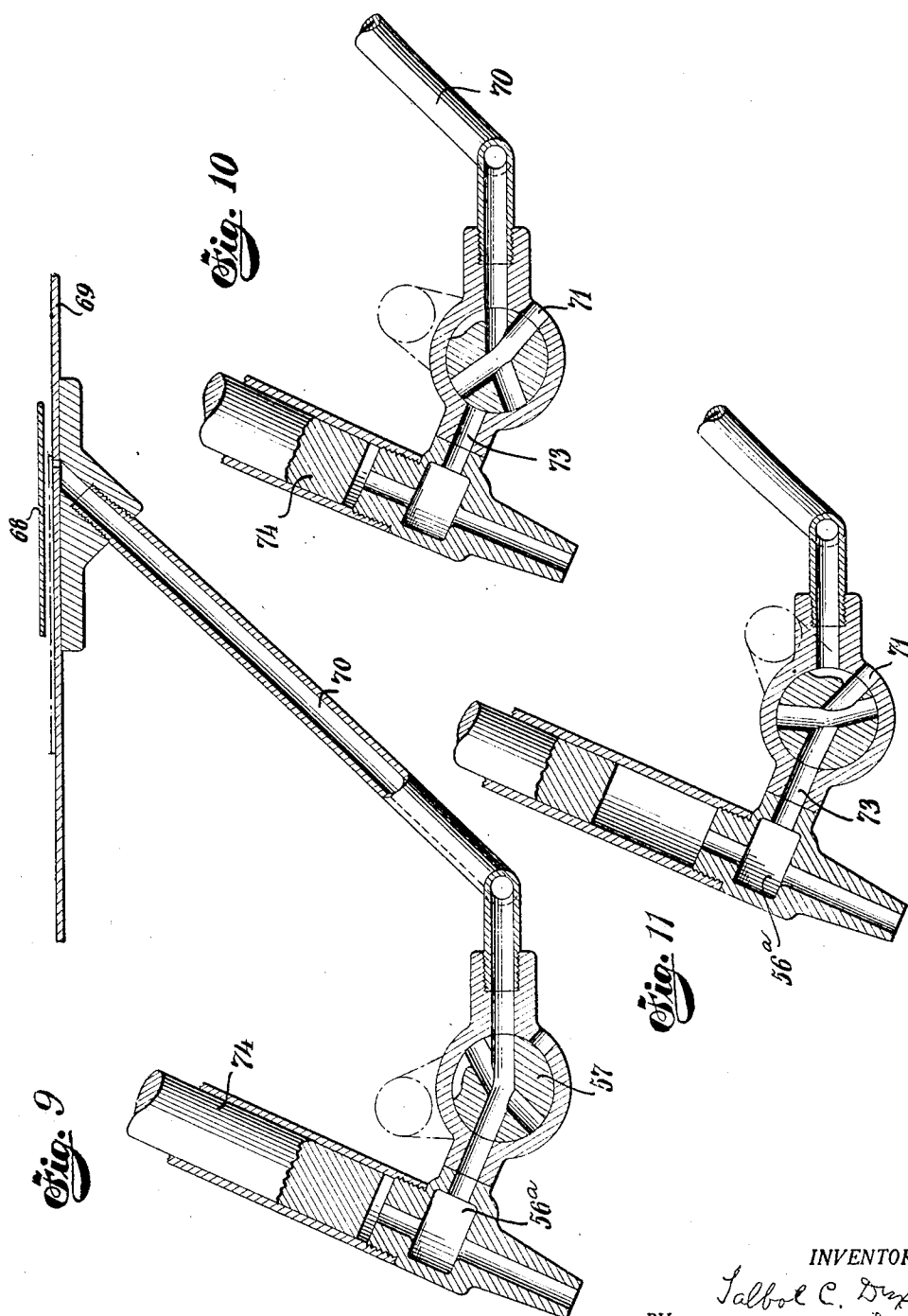
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13 Sheets-Sheet 10

Fig. 15

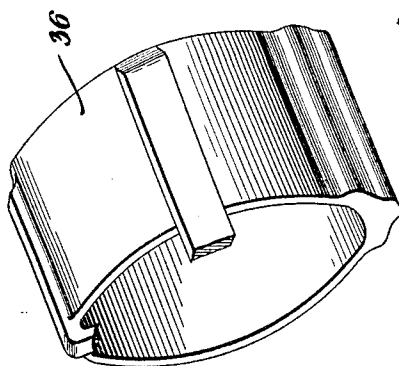


Fig. 14

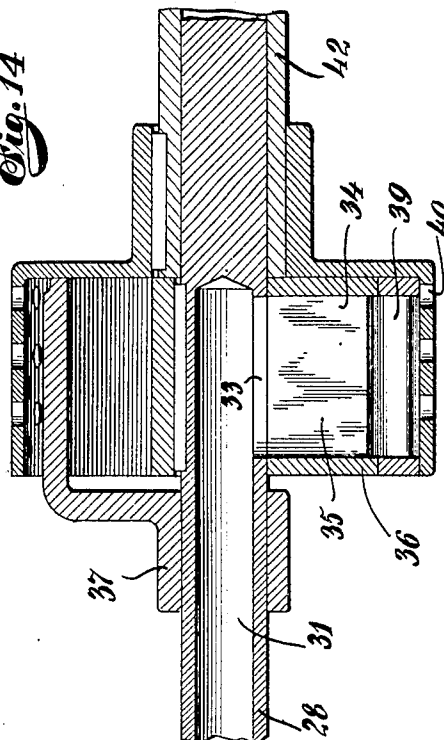


Fig. 12

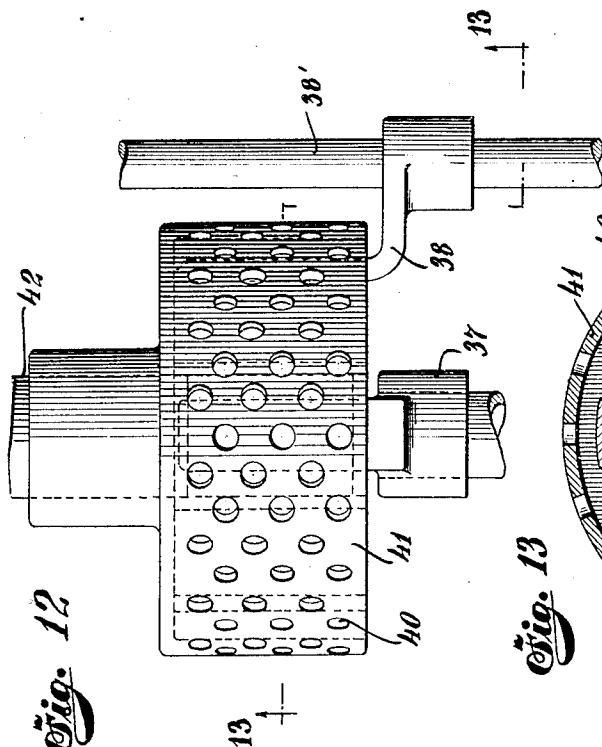
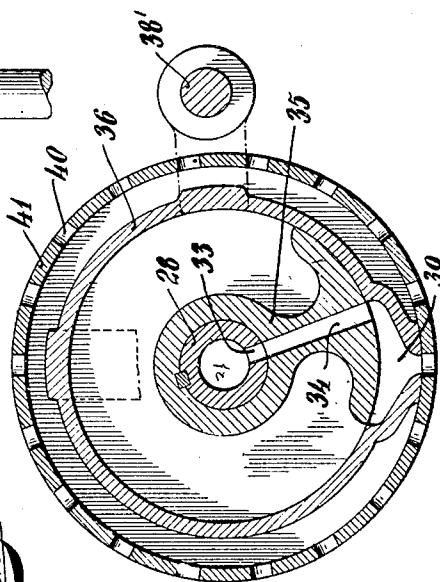


Fig. 13



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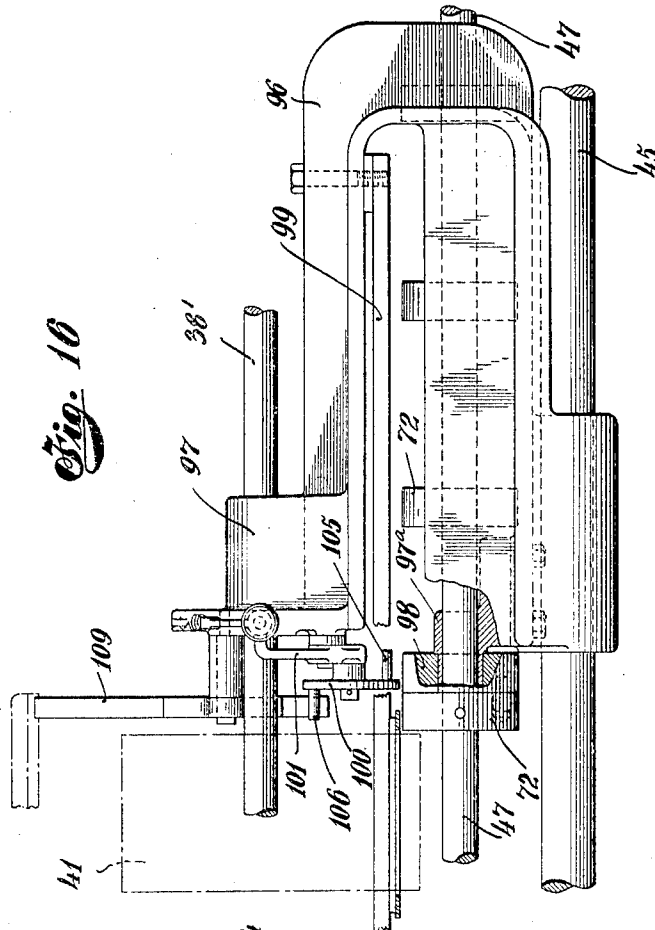


Fig. 16

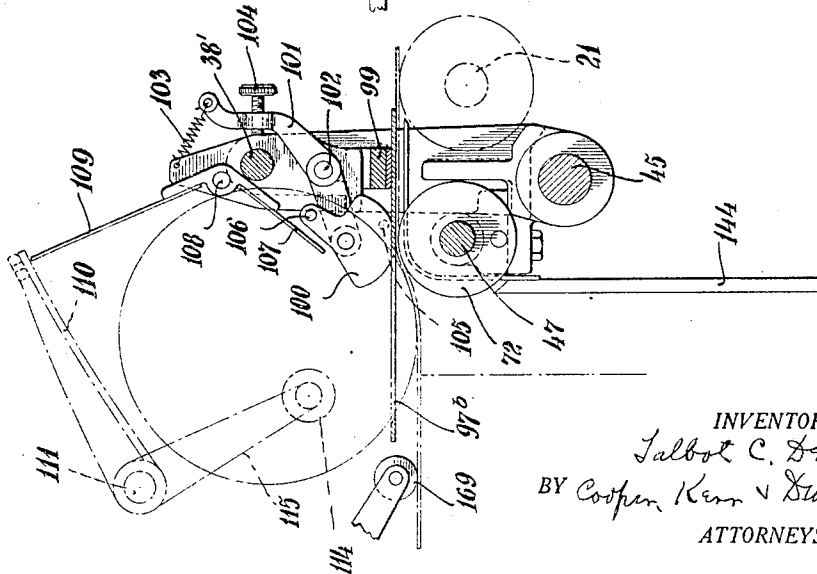


Fig. 17

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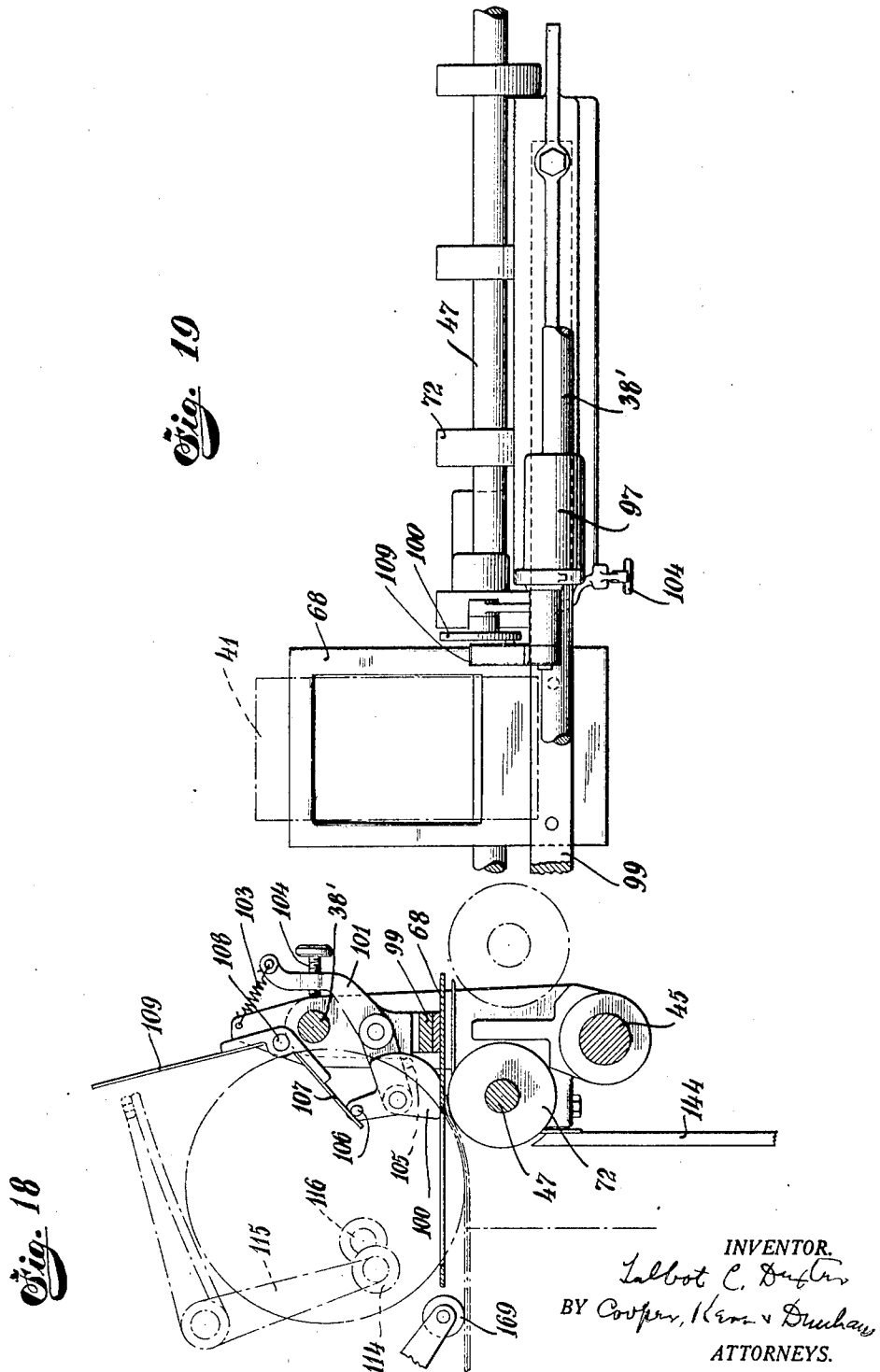
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13 Sheets-Sheet 13

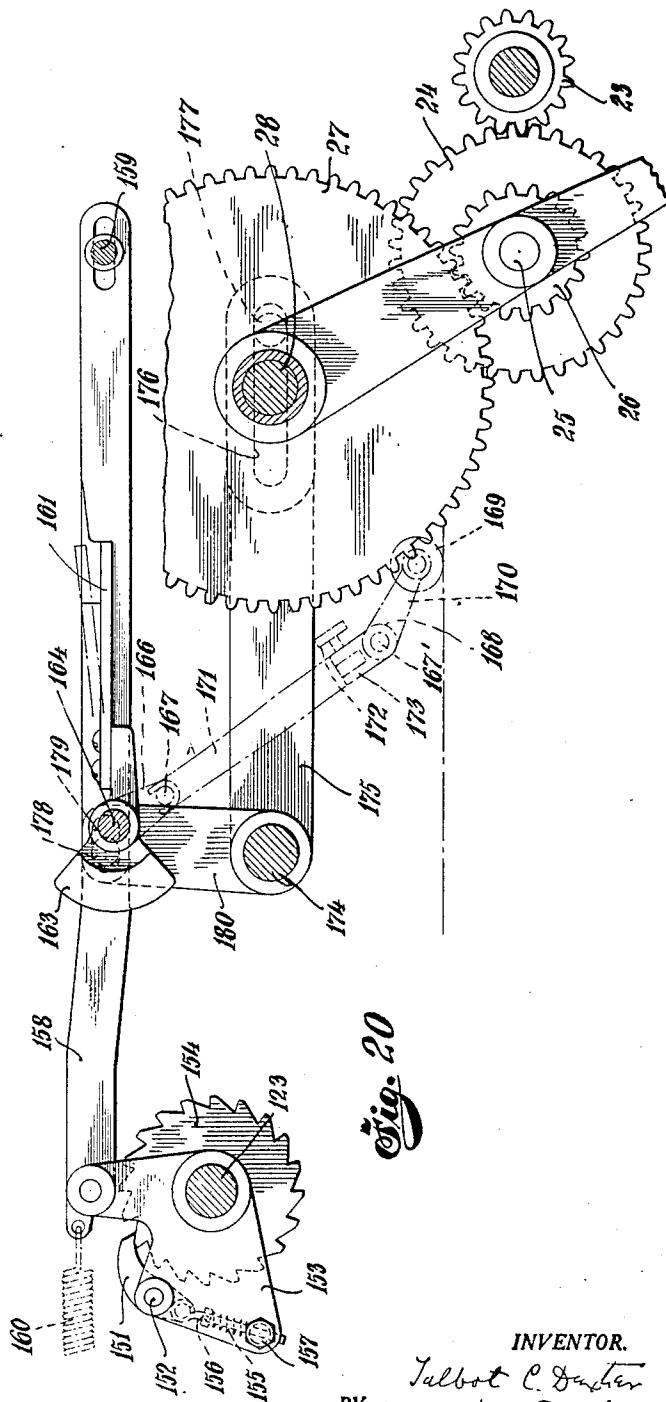
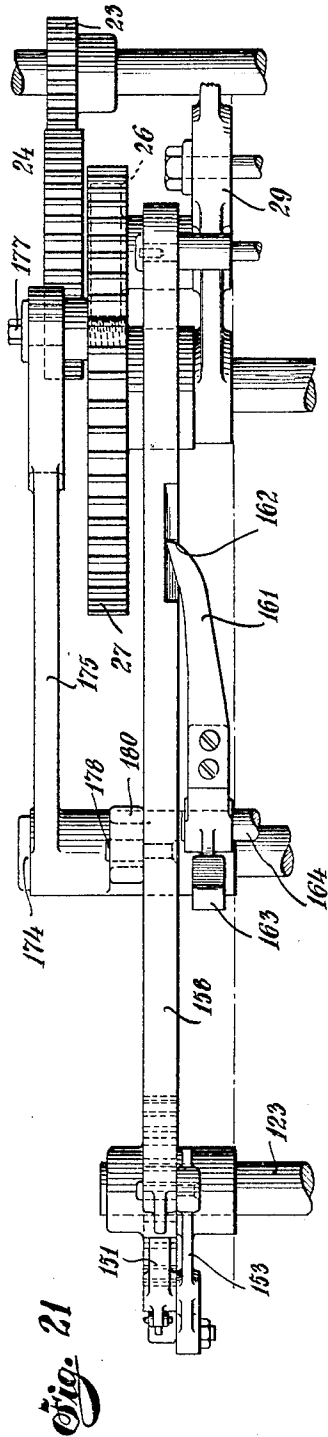


Fig. 20

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UNITED STATES PATENT OFFICE.

TALBOT C. DEXTER, OF PEARL RIVER, NEW YORK.

PAPER-FEEDING MACHINE.

Application filed June 27, 1925. Serial No. 39 901.

This invention relates to paper feeding machines and more particularly to the class of machine wherein pneumatically controlled devices are used to select and feed the paper.

5 Among the objects of invention is to provide a paper feeding machine which acts automatically to control the operation of devices in causing a sheet of paper to be picked up and advanced a predetermined distance.
10 Another object resides in controlling the length of advance of a sheet of paper by the sheet of paper being advanced so that the distance advanced by each consecutive sheet of paper is a constant measurement whereby
15 sheets of paper are deliverable from a feeding machine at a uniform rate.

Another object resides in producing a mechanism in the nature of a sensing device which will determine whether a sheet of
20 greater thickness than that for which the device is adjusted, or whether more than one sheet of paper, has been selected and advanced from the pile of paper, and in either case automatically shut off pneumatic feed
25 devices from operation.

Another object resides in providing mechanism that will cause a pile of paper on a table to be raised by power after a predetermined number of sheets of paper has been removed from the top of the pile.
30

With these and incidental objects in view, the invention consists of certain novel features of construction and combination of parts, the essential elements of which are set forth in the appended claims and a preferred form of embodiment of which is described hereinafter with reference to the drawings which accompany and form part of the specification.
35

Fig. 1 is an elevation of the left side of the paper feeding machine.

Fig. 2 is an elevation as viewed from the front of the machine.

Fig. 3 is a view, partly in section on line 3—3 of Fig. 1.

Fig. 4 is a rear elevation of the machine.

Fig. 5 is a plan view.

Fig. 6 is a sectional view taken on line 6—6 of Fig. 5.

Fig. 7 is an elevation of the right side of the machine.

Fig. 8 is an enlarged view of the controlling mechanism for the pneumatic paper selecting and feeding devices with the parts in normal position.
55

Fig. 9 is a detail of the three position air

passage valve in the first position when feed of paper is discontinued.

Figs. 10 and 11 are details of the three position air passage valve with the valve in the second and third positions respectively.
60

Fig. 12 is a plan view of the suction cylinder.

Fig. 13 is a section of the suction cylinder shown in Fig. 12, on line 13—13.
65

Fig. 14 is a section of the suction cylinder, longitudinal of the axis of the shaft.

Fig. 15 is a perspective view of the fixed member within the suction cylinder.

Fig. 16 is a detail in elevation of the mechanism for automatically shutting off the operation of the paper selecting and feeding devices.
70

Fig. 17 is a section as viewed from the left of Fig. 16 illustrating the relative positions of the parts when one sheet of paper is being advanced.
75

Fig. 18 is a view similar to Fig. 17 illustrating the tripped positions of the parts when two sheets of paper are being advanced.
80

Fig. 19 is a plan view of the structure illustrated in Fig. 16.

Fig. 20 is an elevation of the table raising mechanism.

Fig. 21 is a plan view of the mechanism shown in Fig. 20.
85

Fig. 22 is a detail in perspective of the three control cams for the pneumatic control of the machine.

The entire paper feeding and supporting structure is carried and suspended from left and right frames 10 and 11, the left frame being supported by two columns 12—13, and the right frame being supported by two similar columns 14—15. The lower ends of
90 columns 12—13 are securely embedded in beam 16 and the lower ends of columns 14—15 are likewise securely embedded in beam 17 and both beams may be secured to the floor in a position to feed paper to a printing-press, or to any machine or table. The columns may be cylindrical as shown and in such event a screw connection between each column and frame and beam would be suitable.
95

Frames 10 and 11 are maintained in spaced relation by two parallel rods 18 and 19, Figs. 5 and 6, and rod 20 serves the same purpose for beams 16 and 17.
100

Mounted at the front or discharge end of the machine between frames 10 and 11 is a shaft 21 to which is secured a sprocket wheel 22 and pinion 23. Pinion 23 meshes with gear
110

24, keyed to shaft 25. Also keyed to shaft 25 is a pinion 26 which drives gear 27 on shaft 28, Figs. 3, 5, 7, and 20. Shaft 25 is a stub shaft mounted on arm 29 and gear 24 may
 5 be replaced by another gear whenever it is desired to vary the driving ratio between shaft 21 and shaft 28. Arm 29 is pivoted on shaft 28 and it is locked in its proper position by screw 30.

10 Shaft 28 is journaled in frames 10-11, and it has a bored-out portion 31 forming a conduit which communicates with chamber 32 at its left end by means of holes. At the center of the shaft, the conduit has a slot 33,
 15 Figs. 13 and 14, which opens into a passage 34 in member 35, keyed to shaft 28. Member 35 rotates within annular member 36 which is loosely mounted on shaft 28 by means of hub 37 and held from rotational displacement
 20 by bracket 38 loosely mounted on shaft 38'. This annular member 36 has a chamber 39 which serves as an intermediate channel of communication between passage 34 and holes 40 of suction wheel or feed roll 41 for a short
 25 period of time during a single revolution of member 35.

Feed roll 41 is broad faced and has a plurality of axially aligned series of holes, equidistantly spaced around its flange-like surface. These holes may be of any configuration and spaced in any desired relation to each other. The roll is keyed to sleeve 42 which encases the right-hand portion of shaft 28. Sleeve 42 is driven from shaft 21 through
 30 gear 43 (Figs. 2 and 8) mounted thereon which meshes with idler gear 44, loosely journaled on rod 45. Idler gear 44 meshes with gear 46, fast on shaft 47, Fig. 3. On the right end of shaft 47 is secured a pinion 48 which
 40 drives gear 49 secured to sleeve 42. Feed roll 41 mounted on sleeve 42 is driven in a counter-clockwise direction (Figs. 6 and 13) and as a result of mechanical expediency, member 35 is driven in the opposite direction. The independent series of gears which drive shaft 28
 45 and sleeve 42 bear such relation to each other that the suction wheel or feed roll will be revolved at a greater rate of speed than the rotary member 35, thereby causing several rows of holes 40 to pass the narrow end of chamber 39 during the travel of passage 34 in member 35 past the chamber. It is evident that the angular velocity of rotary member 35 may be changed by replacing gear 24 by one of
 50 another size. The rate of speed with which the paper is advanced is dependent upon the peripheral velocity of the suction wheel 41. The number of sheets fed per unit of time is dependent upon the angular velocity of member 35.
 60

In order to separate the top sheet of paper from the pile of paper 50 on the table 51 a broad end nozzle 52 is provided, Figs. 4 and 6, from which a steady stream of air flows to lift
 65 the top sheet against the surface of the suction

wheel. A continuous pressure is maintained in this nozzle during the operation of the machine by means of a blower (not shown) which has connections 53 with the left end of rod 45 which is drilled out at that end (Fig. 70
 2). A piece of rubber hose 54 connects the nozzle to this hollow section of rod 45.

Having reference more particularly to Figs. 1, 8, 9, 10, and 11 the pneumatic devices for controlling the selection and feeding of
 75 paper will be described. A tube 55 is connected to a vacuum pump (not shown) which continuously operates to create a vacuum in chamber 32. The action produces a sucking effect through holes 40 of suction wheel
 80 or feed roll 41 whenever member 35 is in such a position as to connect, by passage 34, conduit 31 with chamber 39, Fig. 13.

The vacuum is maintained in chamber 32 so long as the chamber is not opened to the atmosphere. Plate 56 which forms the cover plate of chamber 32 has two holes which may be uncovered to break the vacuum in the chamber and the mechanism to cause such
 90 condition will now be described.

57 is a three position valve which is rotatively positioned by a cam 58 on shaft 28, Figs. 3 and 8, which has three concentric surfaces 59, 60, and 61, at different radial distances. Lever 62 is pivoted at 63 to the inner
 95 side of frame 10 and it carries at its upper end an antifriction roller 64 which is urged into engagement with cam 58 by spring 65. The lower end of lever 62 is connected to crank 66 of the rotary portion of valve 57 by link 67.
 100 In the position shown in Fig. 8, valve 57 is in its normal position with roller 64 bearing upon surface 61 of cam 58. Air is being drawn into chamber 56^a between plate 68 and shelf 69 through conduit 70 which has open-
 105 ings in shelf 69.

When passage 34 in member 35 reaches chamber 39 the suction in chamber 32, and hence within shaft 28, will cause air to be drawn in through the holes 40 in feed roll 41
 110 as they pass chamber 39. This action causes the uppermost sheet of paper to be advanced towards and over rollers 72 on shaft 47. This feeding action of the one sheet of paper may continue as long as passage 34 in member 35
 115 is opposite chamber 39 or until the vacuum in chamber 32 is broken. It is desirable to definitely limit the distance of feed of a sheet of paper and in order to insure the discontinuance of the feed at a time certain, I make the
 120 sheet of paper being fed control the time of breaking of the vacuum in chamber 32. This function is performed before roller 64 leaves cam surface 61 and when valve 57 is in normal position, Figs. 8 and 9. As soon as the
 125 sheet of paper being fed reaches the openings in shelf 69 opposite conduit 70, further admission of air will be prevented and the increased suction in chamber 56^a will cause piston 74 and link 75 to be drawn downwardly. The
 130

upper end of link 75 is pivotally connected with the end of arm 76 which is secured to shaft 38'. Also secured to shaft 38' is an arm 79 which carries a spring pressed valve 80 that covers the end of conduit 31 during the advance of a sheet of paper by the feed roll. The action just described occurs as one operation and the removal of valve 80 from its normal position permits air to be admitted into chamber 32 and relieve all suction at the feed roll. Sometimes thereafter passage 34 in member 35 will pass away from a communicating relation with chamber 39.

As shaft 28 turns in a clockwise direction, Fig. 8, roller 64 is cammed outward to an intermediate position on surface 60 and valve 57 is thrown to the position shown in Fig. 10. This position of the valve discontinues communication of chamber 56^a with conduit 70 and the sheet of paper on shelf 69 is freed from the restraining influence of suction. At just about this time, cam 81 on shaft 28 permits anti-friction roller 82 to drop off of high surface 83, Figs. 3, 8 and 22. Roller 82 is mounted on the end of arm 84 which is secured to shaft 85, Figs. 3 and 5. Also secured to this shaft are two arms 86—87, each of which carries a friction wheel 88—89, respectively. When these friction rollers drop, they press the paper against rolls 90 and 91 on shaft 21 and the forward movement of the paper is continued. With valve 57 in its intermediate position, Fig. 10, the vacuum in chamber 56^a maintains piston 74 in a downward position, thereby keeping chamber 32 and conduit 31 open to the atmosphere.

Continued rotation of shaft 28 causes roller 64 to be displaced to its extreme outward position on surface 59 of cam 58. This movement causes valve 57 to assume its third position, as shown in Fig. 11, with the result that the vacuum is broken in chamber 56^a and piston 74 is permitted to raise to its normal position. For the purpose of raising the piston, a crank 92, secured to shaft 38', has pivotally mounted to its outer end a rod 93. Rod 93 slides within a hole in stud 94 against which spring 95 abuts. This spring is comprised between stud 94 and a collar on rod 93 thereby creating a tendency to restore shaft 38' to normal position. With shaft 38' in normal position, valve 80 discontinues communication of conduit 31 and chamber 32 with the atmosphere. The full force of the suction is now existent in conduit 31 and chamber 32 and when passage 34 in member 35 again comes into communication with chamber 39, another sheet of paper will be fed forwardly in the manner just described.

With valve 57 in the position shown in Fig. 11, air may be drawn through chamber 56^a either through conduit 70 or through port 71. When roller 64 is permitted to descend to surface 61 of cam 60, it will cause valve 57 to be displaced to its normal position, Fig. 8,

with chamber 56^a in direct communication with conduit 70. When the next sheet is picked up and fed forwardly by the feed roll 41 the cycle of operation just described will be repeated.

Should more than one sheet of paper be passed along at one time, mechanism is provided for releasing the sheets from contact with suction wheel 41 when they arrive over rollers 72 on shaft 47 and thus stop their forward progress. In regard to the mechanism provided to accomplish this result, attention is directed to Figs. 2, 3, 5, 6, 8, 16, 17, 18 and 19.

As best seen in Fig. 16, a U-shaped casting 96 is mounted on rod 45 and it has a boss 97 through which passes shaft 38'. To the lower branch of casting 96 is bolted a mounting 97^a for a pulley 98 pinned to one of the rollers 72 on shaft 47. Fastened to the under side of the upper arm of casting 96 is a bar 99 which supports plate 68. This plate has an opening 97^b large enough to permit a portion of suction wheel 41 to extend so that it may pick up a sheet of paper and advance it over rollers 72 and beneath plate 68.

To one side of plate 68 and immediately over pulley 98 there is pivotally mounted a sector 100 at the rear end of a lever 101 supported on a stud 102 on boss 97. This lever is drawn by a spring 103 in a counter-clockwise direction (Fig. 17), and its position of rest is determined by a thumb-screw 104 which bears against the boss. This lever is in an adjusted position when a clearance of the amount equal to the thickness of one sheet of paper exists between pulley 98 and sector 100, Figs. 16 and 17. Should two or more sheets attempt to pass between pulley 98 and sector 100, the sector would be swung counterclockwise, Fig. 18, until stud 105 contacts the lower end of lever 101. Such movement would cause stud 106 to contact arm 107 and swing it about its pivot 108 and remove arm 109 from under arm 110 which is loosely mounted on shaft 111. Arm 110 overlies a lateral extension of arm 110' secured to shaft 111 and its weight will cause shaft 111 to be rotated as soon as the high part of cam 112 on shaft 28 has passed from under roller 113 rotatively mounted on arm 110. The position of cam 112 on shaft 28 is such that the action just described will occur just after the sheets of paper strike sector 105 and rotate it so as to cause arm 109 to be removed from under arm 110.

As shaft 111 rotates clockwise valve 114 carried on arm 115, fast to its left end, will be removed from over opening 116 thereby breaking the vacuum in chamber 32 and terminating the effectiveness of suction wheel 41 so that it will no longer be able to advance paper. The opening movement of valve 114 occurs before valve 80 would operate in the operation of the machine and it remains open

until the interfering extra sheet or sheets have been removed from under sector 100. Shaft 111 may then be rotated counterclockwise to its normal position by handle 117 extending from the hub of arm 110' and arm 109 assumes its normal position of support as shown in Figs. 8 and 17 with the under surface of arm 107 bearing against shaft 38'. It is apparent that handle 117 can be rotated to remove valve 114 to break the vacuum in chamber 32 whenever desired.

In order to keep rollers 88—89 from descending until the obstructing sheets of paper have been removed, the following mechanism is provided. Fastened to shaft 111 is a crank 118 to which is pivotally connected a rod 119. The forward end of this rod is pinned to arm 120 which has integral therewith a finger 121 pivoted on a stud. As the valve cap is moved from its normal position, finger 121 will be rotated to a position under finger 122 which is secured to shaft 85 and thus prevent the rollers from descending when the high surface of cam 81 moves from under roller 82 on arm 84 as has been described hereinbefore.

The paper table 51 may be moved upward or downward by the rotation of shaft 123 and a crank handle 124 is provided at its right end for this purpose. This shaft is mounted in side frames 10—11, and carries two worms 125—126, one of which engages a worm wheel 127 and the other of which engages a worm wheel 128 mounted on shafts 129 and 130 respectively. Shaft 129 is parallel to frame 10 and is journaled on brackets extending therefrom. At its rear end is mounted a sprocket wheel 131 over which a chain 132 passes, and to its forward end is secured another sprocket wheel 133 over which a chain 134 passes. Likewise, shaft 130 is parallel to frame 11 and is journaled on brackets extending therefrom. At its rear end is mounted a sprocket wheel 135 over which a chain 136 passes, and to its forward end is secured another sprocket wheel 137 over which a chain 138 passes.

The inside ends of chains 132 and 136 have connected thereto loops 138' and 139 into each of which extends the one of the ends of the central flange of a T-beam 140. The forward chains 134 and 138 have connected to their lower ends, loops 141 and 142 respectively which support the ends of T-beam 143. Table 51 rests upon the T-beams and its height is varied by movement of the chains when shaft 123 is rotated. The free ends of the chains are steadied by weights.

The forward end of the table contacts bars 144 against which the sheets of paper are dressed.

The lateral adjustment of the table is procured by the rotary position of shaft 145 which runs lengthwise of the machine and carries pinions 146—147 which engage racks 148—149 respectively, each of which is fast

to the under side of the table. A handle 150 is provided to rotate the shaft and thereby slide the table in relation to the T-beams. Referring particularly to Figs. 20 and 21, mechanism is provided for raising the table automatically whenever the top sheet of the pile of paper becomes lowered a definite distance from the face of the suction wheel. This mechanism comprises a pawl 151 pivotally mounted on pin 152 extending from bell-crank 153 loosely mounted on shaft 123. Pawl 151 is held in an engaging relation with the teeth of ratchet-wheel 154 by a spring 155, secured to a collar on pin 156 which passes through a hole in stud 157.

Pivoted to the upstanding arm of bell-crank 153 is a link 158 which is supported at its forward end by a slot connection with pin 159 extending from a bracket on frame 11. This link is continually urged rearwardly by a spring 160, but, ordinarily, such movement is prevented by an arm 161 which engages a shoulder 162. The arm and a counterweight 163 are pivoted on a shaft 164 which is journaled at the right end in frame 11 and at its left end in a member 165 which is supported on bars 18 and 19. Fixed to the left end of shaft 164 is a crank 166 from which a pin 167 extends. The forward end of member 165, Figs. 5 and 6, carries a pin 167' on which a collar 168 is mounted. A roller 169 is rotatively mounted on a pin passing through yoke 170 extending forwardly from said collar and an arm 171 is secured by a screw 172 within a fork 173. The upper end of arm 171 is forked so as to engage pin 167 on crank 166 and thereby cause shaft 164 to be rotated counter-clockwise, Fig. 20, when crank 170 rotates clockwise as the paper is gradually removed from under wheel 169. When a definite amount of paper has been removed from under the roller, the forward end of arm 161 will pass away from shoulder 162 and spring 160 will operate to draw link 158 rearwardly and cause pawl 151 to be moved back idly over a tooth of ratchet-wheel 154.

On the outer side of frame 11 there is mounted to turn on stub shaft 174 a bell-crank having an arm 175 in which is disposed a slot 176. A pin 177 extends from gear 27 into this slot and causes a complete oscillation of the bell-crank on every revolution of shaft 28. A pin 178 extends from link 158 and engages a slot 179 in upstanding arm 180 of the bell-crank. This slot is of sufficient length so as not to engage pin 178 when the bell-crank is oscillated during the ordinary operations of shaft 28 when arm 161 abuts shoulder 162, but when arm 161 has escaped from engagement with the shoulder, in the manner above described, and ratchet 151 has engaged a tooth to the rear of its usual position of rest, the rear end of slot 179 will engage pin 178 and return the link 158 to its usual position, when bell-crank 175—180 is again os-

cillated. Arm 161 will then return to its locking position.

When link 158 is thus being restored to its normal position, ratchet 151 will rotate
 5 ratchet-wheel 154 and rotate shaft 123 to cause table 51 to be raised the required distance.

While the form of mechanism herein shown and described is admirably adapted to fulfill
 10 the objects previously stated, it is to be understood that it is not intended to confine the invention to the one form of embodiment herein disclosed, for it is susceptible of embodiment in various forms all coming within the
 15 scope of the claims which follow.

What I claim is:—

1. A paper feeding device comprising a rotary roll with suction paper-holding perforations therein, suction controlling means
 20 within said cylinder comprising coacting stationary and rotary elements with ports therein cooperating with each other and with the perforations in said rotary roll as the latter pass the port in said stationary element.

25 2. In a machine of the class described, the combination of a rotary member having a passageway therein, another rotary member having perforations, a member intermediate said two rotary members, said member having a
 30 channel adapted to communicate said passageway and certain of said perforations, means to evacuate air from said passageway and through said perforations, a valve covering an opening from said passageway, and
 35 means to control the opening of said valve to terminate the effectiveness of said last named means.

3. In a machine of the class described, the combination of a rotary member having a
 40 passageway therein, another rotary member having perforations and adapted to rotate at a greater rate of speed than said first named rotary member, means including a channel bearing member whereby air is drawn
 45 through said passageway and perforations, and means to cause the cessation of the infiltration of air through said perforations.

4. In a machine of the class described, the combination of a rotary member having a
 50 passageway therein, another rotary member having perforations, a member intermediate said two rotary members, said member having a channel adapted to communicate said passageway and certain of said perforations,
 55 means to evacuate air from said passageway and through said perforations, a valve covering an opening from said passageway, means to open said valve, and means operated by said first mentioned rotary member to control
 60 said last mentioned means.

5. In a machine of the class described, the combination of a rotary member having a passageway therein, another rotary member having perforations, a member intermediate said
 65 two rotary members, said member having a

channel adapted to communicate said passageway and certain of said perforations, means to evacuate air from said passageway and through said perforations, a valve covering an opening from said passageway, means
 70 to open said valve, and means controlled by said first mentioned rotary member to operate said last mentioned means at a predetermined time.

6. In a machine of the class described, the
 75 combination of a rotary member having openings in its exterior surface, a hollow member mounted within said rotary member, said hollow member having a channel, means to actuate said rotary member in relation to said
 80 last named member, means to draw air through said openings and said channel, said means including another rotary member having a passageway, and means to control said drawing of air during a definite portion of
 85 the cycle of said last named rotary member.

7. In a machine of the class described, the combination of a rotary member having openings in its exterior surface, a rotary hollow
 90 member driven at a different rate of speed than said first mentioned rotary member, means to actuate said rotary members at speeds of fixed relation to each other, a member intermediate said two rotary members, said member having a channel, means to produce
 95 a suction through said openings, channel and said rotary hollow member, and valve means to terminate the duration of said suction.

8. In a machine of the class described, the
 100 combination of a rotary member having openings in its exterior surface, a rotary hollow member mounted within said rotary member, a member having a channel adapted to communicate certain of said openings and said
 105 hollow member, means to maintain a vacuum in said hollow member, means to allow communication of said hollow member with the atmosphere, and means to control the operation of said last mentioned means during
 110 predetermined periods of rotation of said rotary member.

9. In a machine of the class described, the combination of a hollow shaft, a member
 115 mounted on said shaft and having a passageway communicating with the hollow space thereof, an annular member having a chamber therein alternately communicable with said passageway, a wheel having a perforated flange adapted to slide by said chamber, and
 120 means to rotate said first named member and said wheel relative to said annular member.

10. In a machine of the class described, the combination of a hollow shaft, a member
 125 mounted on said shaft and having a passageway communicating with the hollow space thereof, an annular member having a chamber therein, a wheel having a perforated flange adapted to slide by said chamber, and means to rotate said first named member and
 130

said wheel relative to said annular member so as to bring different perforations in said flange opposite said chamber during a single revolution of said first mentioned member.

11. In a machine of the class described, the combination of a hollow shaft, a member mounted on said shaft and having a passageway communicating with the hollow space thereof, means for rotating said member, a member surrounding said first named member and having a chamber therein, a wheel having a perforated flange and adapted to be rotated about said second named member and chamber, and means for rotating said wheel at a different rate of speed than said first named member so as to present different groups of perforations opposite said chamber on each succeeding communication of said passageway with said chamber.

12. In a machine of the class described, the combination of a suction wheel having perforations, a chamber having communication with said suction wheel, means rotatable within said suction wheel and having a passageway for suctioning air through the perforations into said chamber, and an inner member disposed between said suction wheel and said means having a channel for causing communication between certain of said suction wheel perforations and said passageway in said means.

13. In a machine of the class described, the combination of a suction wheel having perforations, means to cause certain of said perforations to be effective during the rotation of said suction wheel, a chamber having communications with said suction wheel, a valve for said chamber, and pneumatically controlled means to operate said valve at a certain time related to the rotary position of said suction wheel.

14. A paper feeding device comprising in combination with a cylindrical feed roll provided with a plurality of perforations through which suction may be induced to hold the paper to be fed against the cylinder, a conduit connected with said feed roll for drawing air therefrom, a valve adapted to cause said conduit to be opened to the atmosphere, pneumatic means to displace said valve, and means operable at a predetermined point on the rotation of said feed roll for rendering said pneumatic means effective.

15. A paper feeding device comprising in combination with a cylindrical feed roll provided with a plurality of perforations through which suction may be induced to hold the paper to be fed against the cylinder, a conduit connected with said feed roll for

drawing air therefrom, a valve closing the end of said conduit, means to operate said valve, and pneumatically controlled means to render said operating means effective to operate said valve and to allow said operating means to be returned to its normal position for closing said valve.

16. A paper feeding device comprising in combination with a cylindrical feed roll provided with a plurality of perforations through which suction may be induced to hold the paper to be fed against the cylinder, a conduit connected with said feed roll for drawing air therefrom, a valve closing the end of said conduit, and automatic means controlled by a piece of paper being fed to displace said valve and maintain it displaced during the passage of a sheet of paper.

17. A paper feeding device comprising in combination with a cylindrical feed roll provided with a plurality of perforations through which suction may be induced to hold the paper to be fed against the cylinder, a conduit connected with said feed roll for drawing air therefrom, a valve closing the end of said conduit, means including an air cock for displacing said valve from its closed position, and means to control the operation of said last mentioned means to displace said valve from its closed position.

18. A paper feeding device comprising in combination with a cylindrical feed roll provided with a plurality of perforations through which suction may be induced to hold the paper to be fed against the cylinder, a conduit connected with said feed roll for drawing air therefrom, a valve closing the end of said conduit, means to maintain said valve in a closed position, means including an air cock for displacing said valve, means to control said last mentioned means to displace said valve from its closed position, and to permit said first mentioned means to return said valve to closed position after the sheet of paper has left close proximity to said feed roll.

19. A paper feeding device comprising a feed roll having paper holding suction ports therein, a conduit connected with said feed roll for drawing air through said suction ports, a valve covering a port in said conduit, and means for causing said valve to be displaced from said port, said last named means including a valve for controlling the position of said first mentioned valve until the sheet of paper has been disposed of.

In testimony whereof I hereto affix my signature.

TALBOT C. DEXTER.