Dec. 25, 1928. 1,696,755

M. FEYBUSCH ET AL

GUMMING MACHINE

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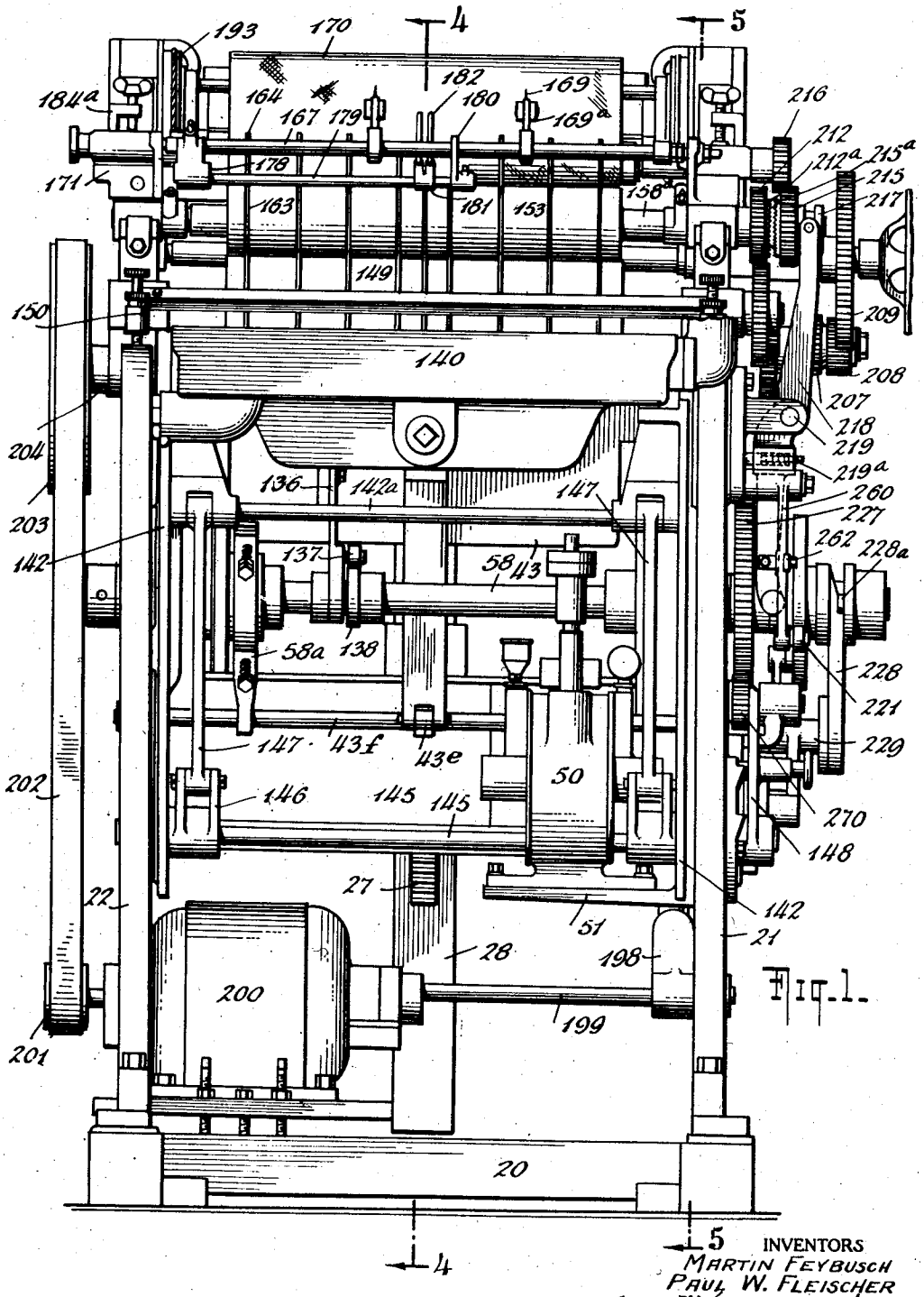


Fig. 1.

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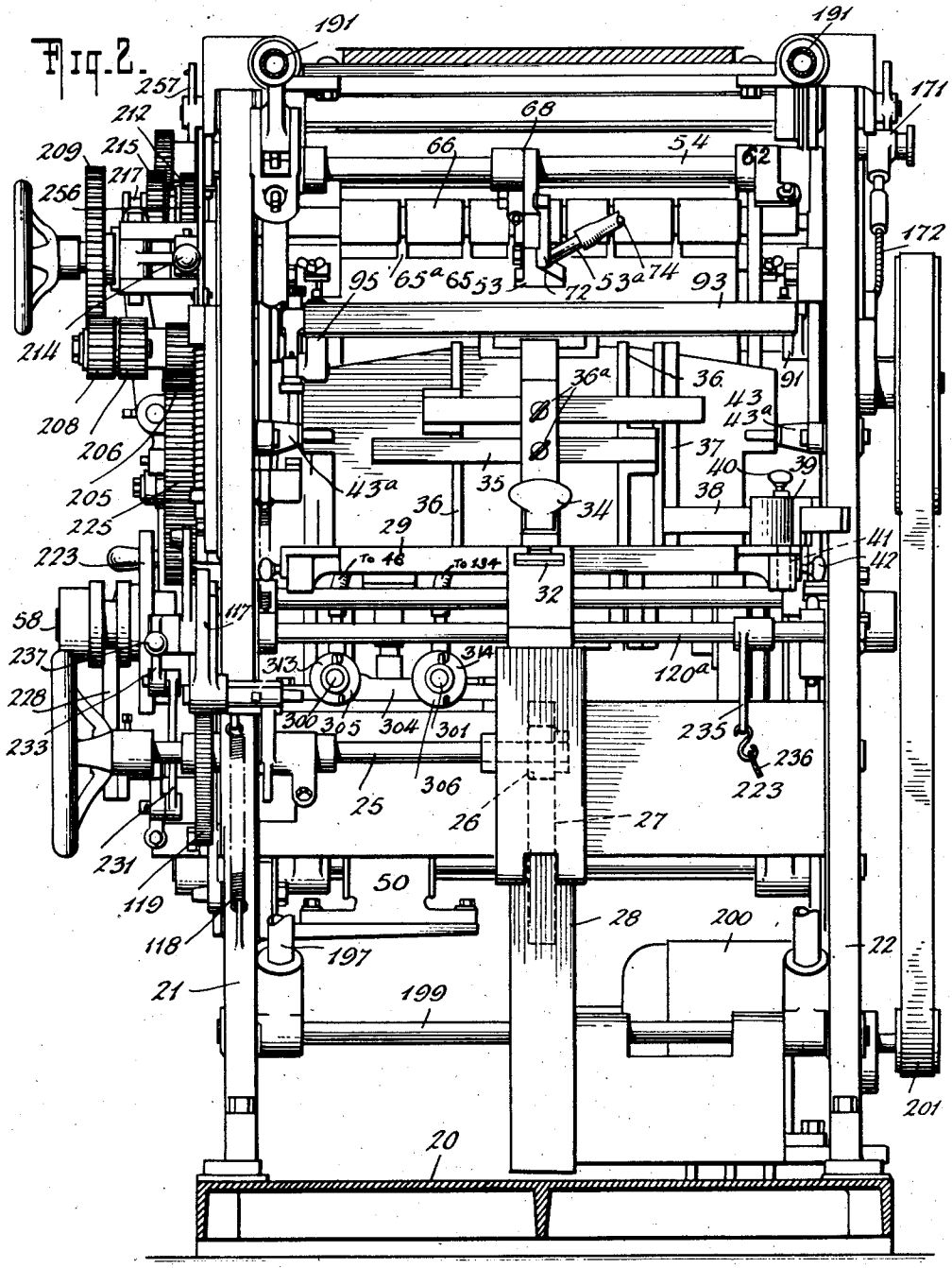
Dec. 25, 1928. 1,696,755

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GUMMING MACHINE

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Fig. 2.



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GUMMING MACHINE

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Fig. 3.

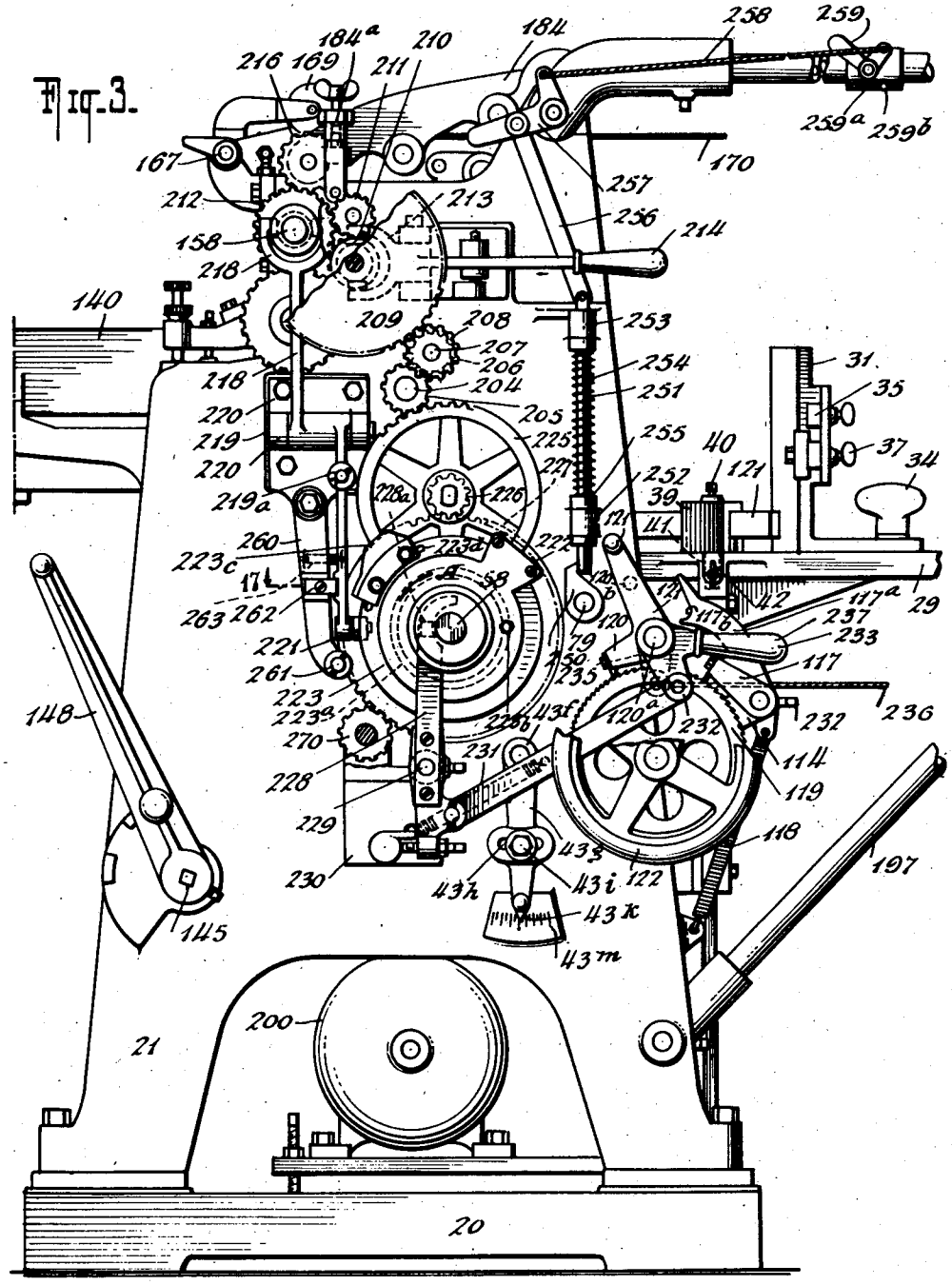
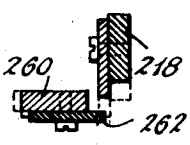


Fig. 17.



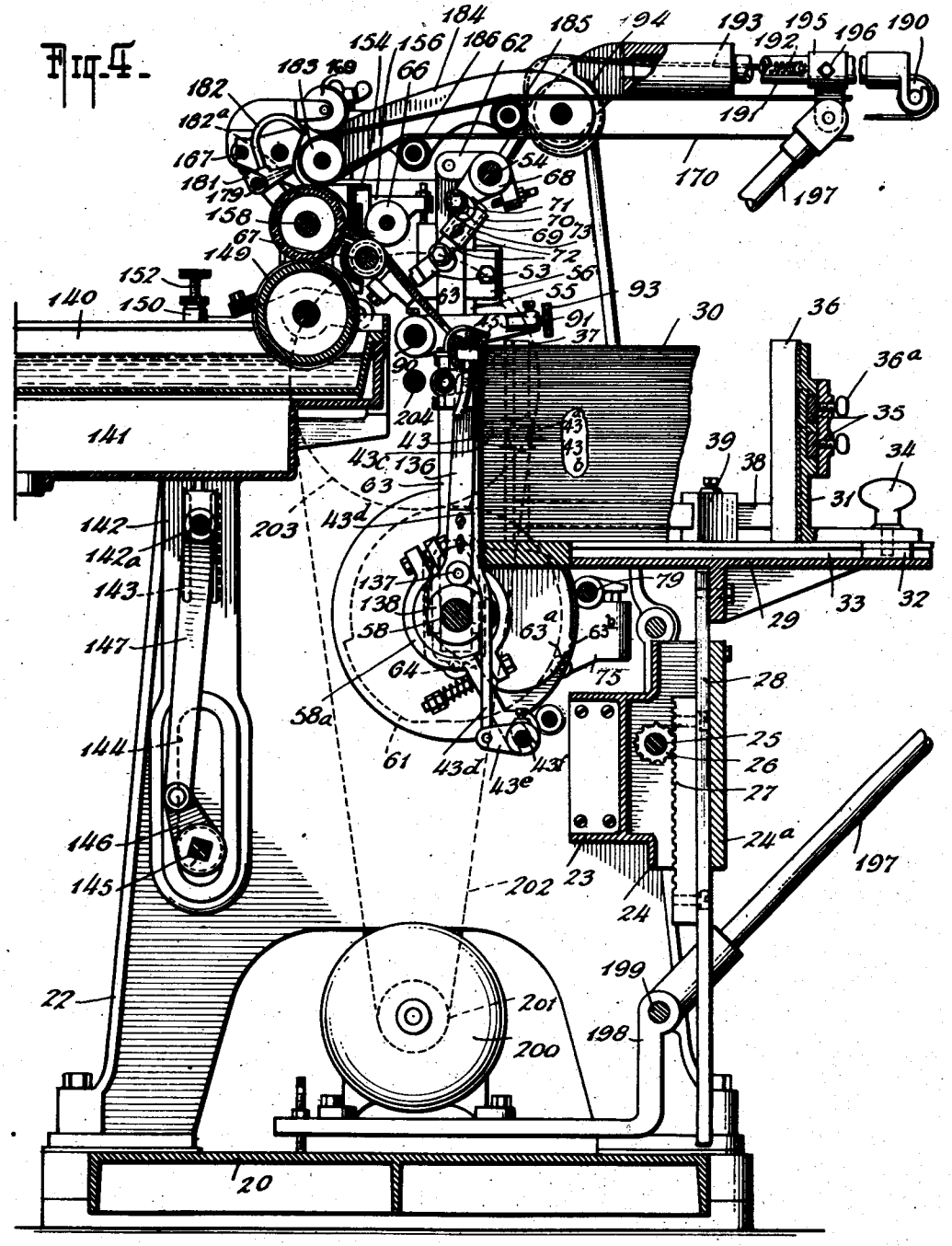
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GUMMING MACHINE

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Fig. 4.



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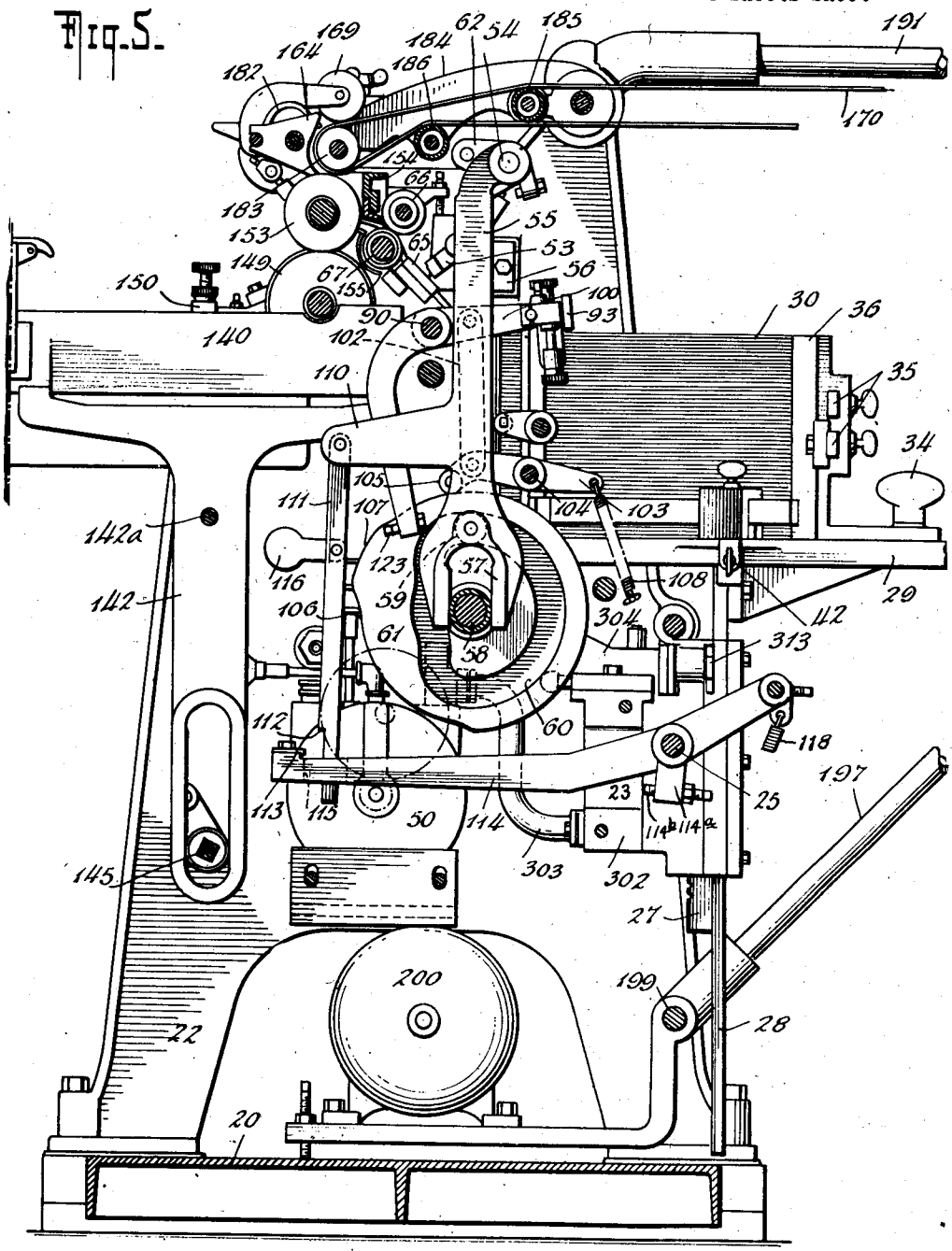
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Fig. 5.



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GUMMING MACHINE

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Fig. 6.

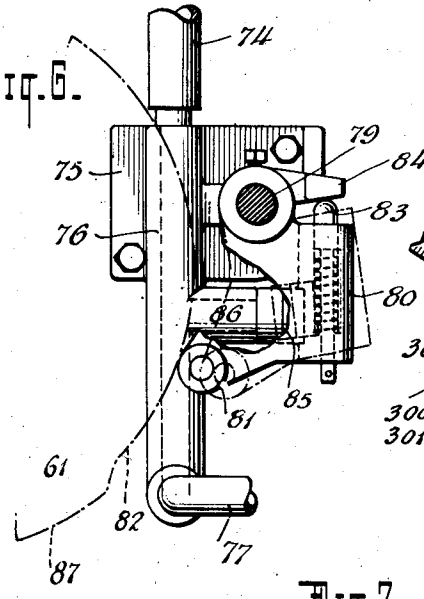


Fig. 18.

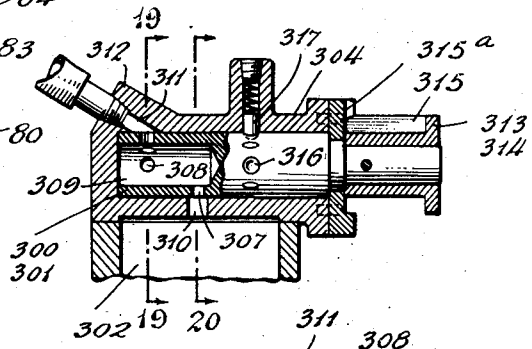


Fig. 19.

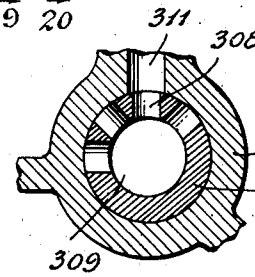


Fig. 7.

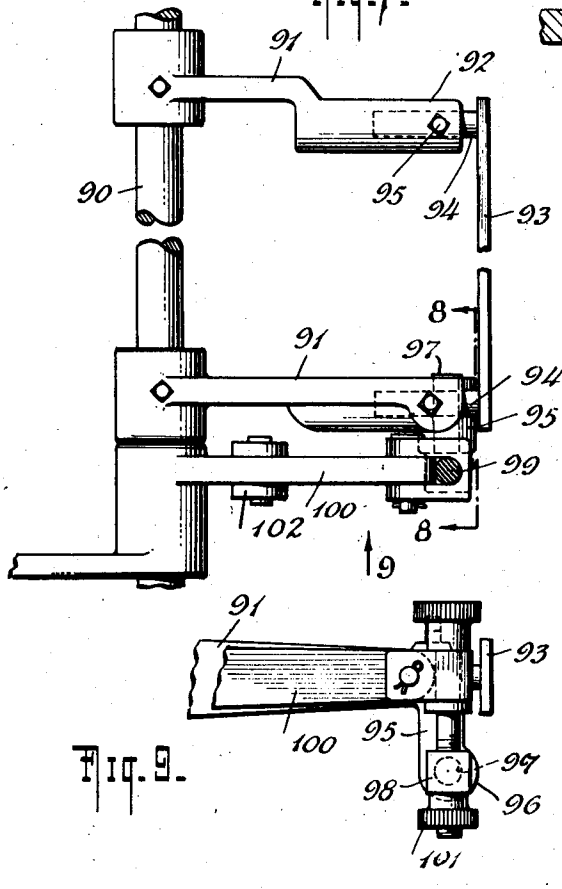


Fig. 20.

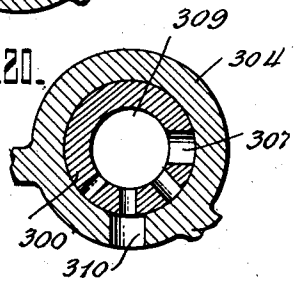
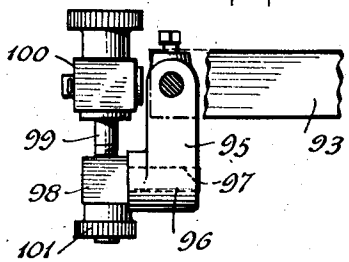


Fig. 8.



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GUMMING MACHINE

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Fig. 10.

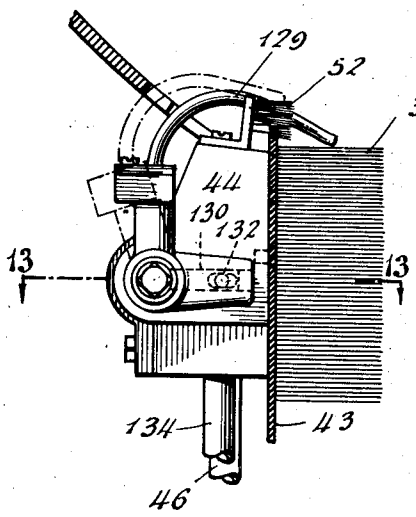


Fig. 11.

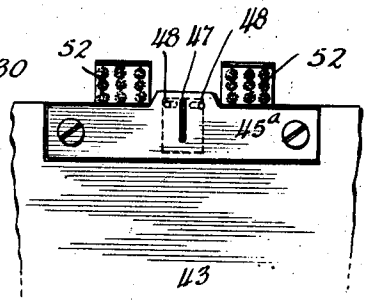


Fig. 12.

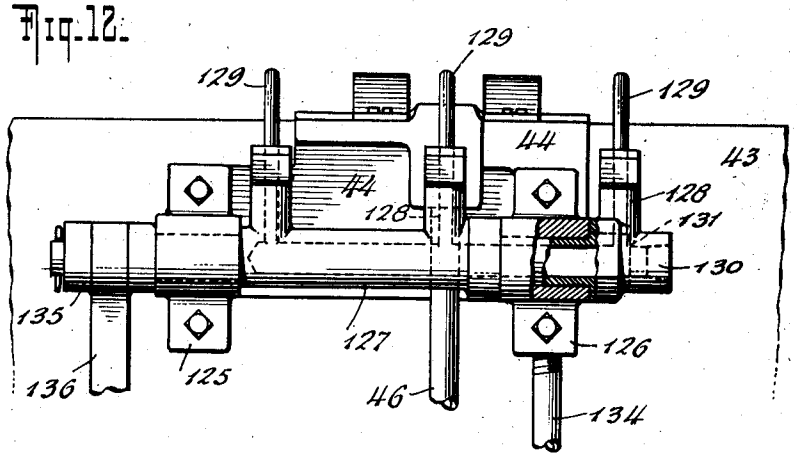
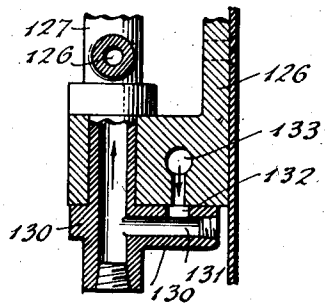


Fig. 13.



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GUMMING MACHINE

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Fig. 14.

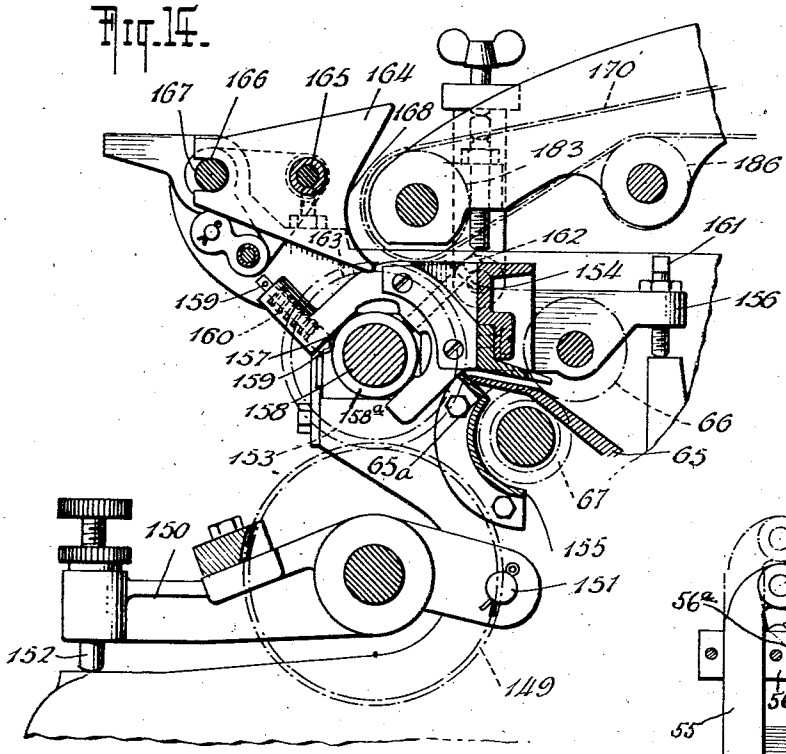


Fig. 21.

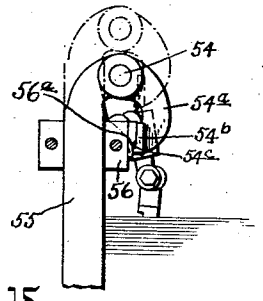


Fig. 15.

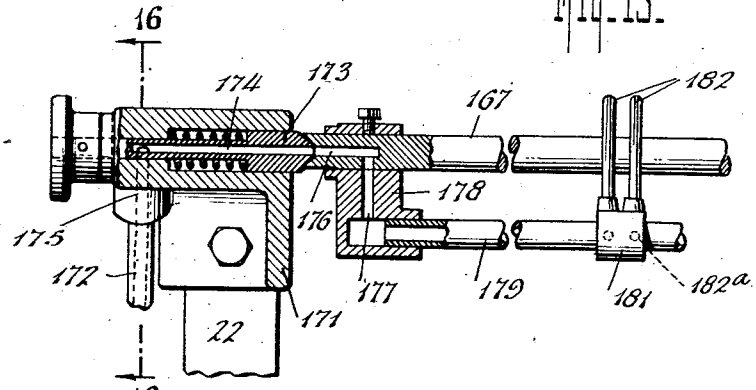
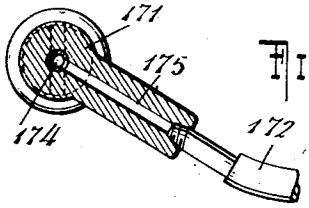


Fig. 16.



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UNITED STATES PATENT OFFICE.

MARTIN FEYBUSCH, OF NEW YORK, N. Y., AND PAUL W. FLEISCHER, OF WEEHAWKEN, NEW JERSEY, ASSIGNORS TO NEW JERSEY MACHINE CORPORATION, OF HOBOKEN, NEW JERSEY, A CORPORATION OF NEW JERSEY.

GUMMING MACHINE.

Application filed April 1, 1925. Serial No. 19,821.

This invention relates to machines for handling paper sheets, labels, or the like and has for its principal object to provide a new and improved construction of a machine of the type that automatically removes a paper sheet from a stack of such sheets, feeds it to a mechanism for performing some operation thereon, as for example, applying a coating of adhesive thereto, and then conveying the sheet away from said mechanism preferably to another machine for further manipulation or treatment.

Another object of the present invention is to improve upon the machine disclosed in our co-pending application for United States Patent filed January 15, 1923, under Serial No. 612,618, in which is disclosed a machine for gumming labels, particularly adapted for use with a second machine, such for example as a paper box wrapping or labeling machine, or a can labeling machine. As the particular operation performed by the said second machine is immaterial, in so far as the present invention is concerned, such second machine will be hereinafter referred to as the secondary machine. While these secondary machines operate continuously to perform a certain cycle of operations, the labels must be delivered to them one by one, that is intermittently, at a predetermined point or step in each cycle of operation. Therefore, the operation of gumming machine must be timed to accord with the operation of the secondary machine to which it delivers the sheets or labels. The feeding of single sheets of paper by automatic machinery, particularly when such sheets are gummed and also when they must be delivered in accurate timed relationship presents special problems, consequently it has been exceedingly difficult to devise automatic machinery for this purpose, which would not require the employment of highly skilled operatives, nor necessitate frequent stoppages of the machine for adjustment and repairs. It is a further object of our invention to provide an automatic machine of the character set forth which will meet the requirements enumerated above and will operate with great reliability and efficiency.

Considered more specifically, other objects of the present invention are to improve upon the construction and operation of the means for separating and removing the sheets or labels from the stack,—the means for automatically elevating the stack or pile of sheets so as to maintain the top surface of such stack between certain predetermined levels and thereby insure the proper contact of the sheet removing arm with the top sheet of the stack,—the means for insuring the removal of the sheets or labels from the gumming mechanism by the conveyor,—the means for spacing the labels upon the conveyor,—the manner of mounting the conveyor to permit it to be adjusted for delivering the labels to different types of secondary machines,—the construction and operation of the glue applying roll and its associated parts so that the adhesive will be applied to the sheets with a wiping action so as to smooth the adhesive coating,—to improve upon the construction of the means for controlling the operation of the gumming machine by the operator of the labeling machine, and finally to provide a novel construction for positively controlling, in accordance with the thickness of the paper being handled, the amount of air delivered to certain blowing nozzles used in the machine.

These and further objects will be apparent to one skilled in the art to which the invention appertains from the following more detailed description and by reference to the accompanying drawings forming a part hereof, and wherein Fig. 1 is a front elevation of the machine embodying my invention; Fig. 2 is a rear view; Fig 3 is a side elevation; Fig. 4 is a section taken substantially on the line 4—4 of Fig. 1; Fig. 5 is a section on the line 5—5 of Fig. 1; Fig. 6 is an enlarged sectional detail of the suction release valve; Fig. 7 is a detail plan view partially broken away of the regulating bar for controlling the automatic operation of the table elevating means; Fig. 8 is a section on the line 8—8 of Fig. 7; Fig. 9 is a side elevation of the structure shown in Fig. 7 looking in the direction indicated by the arrow 9; Fig. 10 is an enlarged sectional detail of the sheet separating means showing a portion of a stack of sheets or labels; Fig. 11 is a view of a portion of the structure shown in Fig. 10 as seen from the right hand side thereof; the stack of labels being removed; Fig. 12 is an elevation of the structure shown in Fig. 10; Fig. 13 is a section on the line 13—13 of Fig. 10; Fig. 14 is an enlarged sectional detail of those parts of

the machine which deliver the labels to and from the glue applying roller; Fig. 15 is a horizontal sectional detail, on an enlarged scale, of the air nozzle and associated parts which cause the labels to be delivered with certainty to the conveyor; Fig. 16 is a section on the line 16—16 of Fig. 15; Fig. 17 is a section on the line 17—17 of Fig. 3; Fig. 18 is a sectional detail of an air regulating valve; and Figs. 19 and 20 are sections on the lines 19—19 and 20—20 of Fig 18; Fig. 21 is a modification of a constructional detail.

For convenience and clarity of description the construction of the various parts of the machine will be described under the following headings: Label stack supporting means; Sheet separating means; Sheet removing means; Table elevating means; Means for preventing dragging of sheets; Gluing mechanism; Means for removing the sheets from the glue applying mechanism; Positive air controlling means conveyor, Driving mechanisms, Means for distant control, Operation.

Label stack supporting means (Figs. 2, 3 and 4).

The main framework of the machine consists of a base 20 to which is suitably secured a pair of side frames 21 and 22. Extending between and bolted to the frames 21 and 22 at the rear end thereof, is a bracket 23, (see Figs. 2 and 4) having a rearwardly projecting housing 24 integral therewith. Mounted upon a stub shaft 25 which extends through said housing, is a pinion 26 which meshes with a rack 27 secured to a vertically extending table elevating bar 28. The upper end of the bar 28 is secured to a vertically movable table 29, upon which a stack of labels 30 is adapted to be placed; said bar being slidably mounted in a guide way formed by the rear face of the housing 24 and a channeled cover plate 24^a.

In order to hold the stack of labels in proper alignment upon the table 29, we provide a knee bracket 31, adjustable longitudinally of the table and having a bolt 32 passing therethrough; the head of said bolt being mounted within a slot 33 which extends along the longitudinal center of the table, and being provided with a ball headed nut 34 for securing the bracket 31 in adjusted position. The vertically extending wall of bracket 31 has slidably mounted therein a pair of horizontally extending bars 35, each of which has secured to one end thereof, a vertically extending rod 36 for engaging the rear side edges of the label stack. Set screws 36^a are provided for holding the bars 35 in adjusted position. The front side edges of the stack are maintained in proper position by means of a pair of members, each of which comprises a vertically extending bar 37, similar to the bar 36, secured to the end of a rod 38, adjustable longitudinally of a bracket 39; the brackets 39 being provided with set screws 40 to hold the bars 38 in position and having dowel pins 41 (see Fig 2), adapted to engage within suitable apertures provided in the table 29; set screws 42 also being provided for engaging the dowel pins and holding the brackets 39 and rods 38 at the proper adjusted angular positions.

The top portion of the plate 43, against which the front edges of the sheets 30 rest, is supported and guided for limited vertical movement by a pair of levers 43^a, having one end pivotally mounted upon the pins 43^b, secured in the side frames 21, 22, and their other ends pivotally connected to the pins 43^c, secured to and projecting beyond the side edges of the plates (see Figs. 2 and 4). A somewhat similar arrangement is provided for the bottom portion of the plate 43; a supporting bar 43^d, having its upper end secured to the plate 43, is pivoted at its lower end to a lever 43^e, which is fixedly secured to a transverse shaft 43^f, mounted in suitable bearings provided in the side frames 21, 22. One end of the shaft 43^f extends outwardly beyond the side frame 21 and has secured thereto an operating lever 43^g (see Fig. 3). The operating lever is provided with an elongated slot 43^h through which the bolt 43^i passes for securing the lever and connected parts in adjusted position. The outer end of lever 43^g is preferably formed to provide a pointer or indicator 43^k, and a scale 43^m may be provided for indicating various adjusted positions of the lever and plate 43.

Sheet separating means (Figs. 4, 10 to 13 inclusive and 18).

Secured to the plate 43, adjacent to the central top part thereof, is a bracket 44 (see Figs. 4 and 10) which is provided with a conduit 45 to which air is supplied from the blower side of a pump 50, (Fig. 1), by means of a pipe 46 (Fig. 10) a regulating valve being interposed between said pump and pipe. The pump 50 is supported upon a bracket 51 secured to the side frame 22 and is driven by mechanism to be hereinafter described. The delivery end of the conduit 45 is closed by a plate 45^a (Fig. 11) seated within an opening provided at the upper edge of the plate 43, and provided with a central elongated slot 47 and a pair of inclined apertures 48, one on each side of said central slot; the inclination of the apertures 48 being such as to direct the air currents towards the side edges of the sheets 30. Air is blown continuously through the slot 47 and apertures 48, and serves to separate the top sheets from the stack, thereby tending to prevent two sheets from adhering together when the top sheet is removed by the sheet removing head presently to be described.

Additional means are also provided to prevent the removal of more than one sheet at a time from the label stack and such means

may comprise a brush 52 or other suitable means suitably mounted upon the bracket 44, the bristles of the brush being located above the top plate 43 and projecting towards the front edge of the label stack so that as the sheets are removed and carried from the stack by the sheet removing mechanism, the front edge thereof will be drawn across the ends of the brush bristles with a wiping motion which will separate the lower sheet or sheets from the top sheet if two or more sheets are picked up.

Sheet removing means (Figs. 2, 4, 5 and 6).

The sheet removing mechanism consists of a suction head 53 (Figs. 2, 4 and 5) carried by a rock shaft 54 rotatably mounted in the upper ends of a pair of vertically extending arms 55. The arms 55 are mounted for vertical reciprocation adjacent to the side frames 21, 22, and lateral movement thereof is prevented, by suitable guides 56 secured to the side frames and with which the upper portions of the arms are engaged, and by the bifurcated lower ends 57 (Fig. 5) of the arms 55 which straddle a cam shaft 58. Adjacent to the bifurcated lower ends 57, each rod 55 is provided with a roller 59, which engages within a cam groove 60 provided in a cam 61 fixedly secured to the cam shaft 58; a pair of said cams being provided, one adjacent to each side frame 21, 22.

The rock shaft 54 also has secured thereto, a short distance from the side frame 22, a crank arm 62 (Figs. 4 and 5) having secured to its outer end an operating arm 63 (Fig. 4) which is provided at its lower end with an elongated slot through which the cam shaft 58 passes. A roller 64 carried by the arm 63 engages with the periphery of a cam 63^a, secured to the cam shaft 58 alongside the cam 61 nearest the side frame 22. A suitable spring (not shown) is connected with the arm 55 and arm 63 for holding the roller 64 in engagement with cam 63^a. The cams 61 with their cam grooves are arranged to cause the crank shaft 54 and suction head 53 to be reciprocated vertically, and while they are at the same time oscillated by the cam 63^a, arm 63, and crank 62, so that the lower face of the suction head 53 is brought into contact with the top sheet 30 of the stack of labels, to raise the sheet, then carry it forwardly over the inclined feed plate 65, and deliver it to the co-operating feeds rolls 66, 67. Both the upper and lower feed rolls 66, 67 are provided with spaced circumferentially extending grooves. Extension fingers 65^a are formed on the upper edge of the feed plate 65, said extension fingers projecting into the groove of the lower roll 66 and terminating closely adjacent to the glue applying roller, to be hereinafter described, and supporting the sheet until it is carried along by said glue applying roller.

As a further precaution against the removal of more than one sheet at a time from the stack the sheet removing or suction head 53 has imparted to it a slight rearward movement, parallel to the plane of the top sheet of the stack, which movement occurs simultaneously with the lifting of the sheet.

This movement of the suction head may be effected by the provision of a small hump 63^b, (Fig. 4), upon the periphery of the cam 63^a, arranged to engage the roller 64 on the arm 63 just as the suction head is caused to begin its upward movement by the action of the cams 61 and rods 55.

A modified and preferred construction for producing this slight rearward movement of the suction head is shown in Fig. 21 of the drawing and comprises an arm 54^a secured to the rock shaft 54 adjacent to one of the side frames. The arm 54^a terminates at its free end in a shoe 54^b which is adapted, when the suction head 53 is brought down into contact with the sheet stack, to engage with the rear face of the adjacent guide 56 for the arm 55, said shoe being held in contact with said guide by the spring (not shown) for holding the roller 64 in engagement with the cam 63^a. The contacting faces of the shoe 54^b and guide 56 are provided respectively with a projecting rib 54^c and a recess 56^a adapted to interlock when the shaft 54 and suction head are moved to their lowest positions by the cams 61. The rib 54^c and recess 56^a have inclined cam surfaces at their upper ends to cause a slight rearward or counter clockwise movement of the arm 54^a, shaft 54 and suction head 53 just at the beginning of the raising movement of the rock shaft and suction head by the cams 61. The construction shown in Fig. 21 serves not only to produce the desired slight rearward movement of the suction head 53 but also overcomes the tendency of said head to vibrate or chatter as it is moved to its sheet engaging position, this vibration or chattering being objectionable when the machine is being used for a job which requires very accurate registering of the labels on the article to which they are affixed.

In order that the suction head 53 may be adjusted to meet changing conditions, it is secured to the rock shaft 54 by means of a sectional arm construction which consists of a bracket 68 fixedly secured to the rock shaft and having at its lower end an elongated arcuate slot 69. A second bracket 70 has screwed therein a bolt 71 which passes through the elongated slot 69 for connecting the two brackets together. The second bracket 70 in turn carries a mouth piece bracket 72 secured thereto by a vertically extending slot and bolt connection 73; the bracket 72 having connected thereto the suction head 53. It will thus be seen that the arcuate slot 69 permits adjustment of the suction head 53 about the axis of the rock shaft 54, while the vertically extending elongated slot connection 73 permits vertical adjustment.

The suction head 53 is in the form of a hollow casting, in accordance with the usual construction of devices of this character, having in its lower face a plurality of apertures through which suction, produced by the pump 50, is exerted upon the sheets or labels to be taken from the stack. A laterally extending nipple 53ª (Fig. 2) communicates with the interior of the suction head and has connected thereto one end of a flexible tube 74, the other end of which tube is connected with a suction release valve (see Figs. 4, 5 and 6). This release valve comprises a bracket 75, suitably secured to the side frame 22 and provided with an air conduit 76 (Fig. 6), which furnishes communication between the pipe 74 and the pipe 77 leading to the pump 50. Secured upon a transversely extending shaft 79, which is rotatably mounted in the bracket 75, is a valve member 80, provided at one end thereof with a cam roller 81 adapted to be engaged by the periphery 82 of the cam 61, mounted upon the cam shaft 58 adjacent to the side frame 22. A spring plunger 83 slidably mounted in a suitable bore of the valve member 80 engages with a rearwardly extending lug 84 provided upon the bracket 75 and serves to normally hold the cam roller 81 in contact with the periphery of its cam 61, and also to hold a packing plug 85, suitably secured to the valve member 80, in engagement with the end of a laterally extending branch 86 of the conduit 76. The periphery of cam 61 as clearly shown in Fig. 6 is provided with a throw portion 87 which at predetermined intervals engages the cam roller 81 and moves the valve member 80 in a counter clockwise direction against the action of the spring pressed plunger 83, to thereby throw the conduits 86 and 76 in communication with the atmosphere and destroy the suction from the pump 50 to the suction head 53; the throw 87 of the cam being so arranged that the suction within the suction head 53 will be interrupted just as the suction head is delivering a sheet or label to the feed rolls 66, and 67.

Table elevating means (Figs. 4, 5, 7, 8 and 9).

As the sheets are removed from the stack by the suction head 53, the height of the upper surface of the stack will be gradually lowered, therefore it becomes necessary to provide means for raising the table 29 from time to time in order to maintain the top sheet always in a position such that it may be engaged by the suction head. The following means have been provided for this purpose: fixedly secured to a transverse shaft 90 (see Figs. 4, 5, 7, 8, and 9) is a pair of rearwardly projecting arms 91 (Fig. 7), each being provided at their rear extremities with an apertured boss 92. A bar 93 extends transversely of the machine above the upper surface of the label stack, and is provided at each end with a laterally projecting stud 94, slidably received within its corresponding apertured boss 92; set screws 95 being provided to hold the bar 93 in adjusted position. Mounted upon one of the studs 92 is a depending bracket 95 (Fig. 8), having at its lower end an apertured boss 96 into which extends a stud 97 projecting laterally from a nut 98. The nut 98 is mounted upon one end of the screw 99 which passes rotatably through the rear outer end of a two armed lever 100. The lever 100 (see Fig. 5) is rotatably mounted upon the shaft 90 and extends forwardly and downwardly, a lock nut 101 being provided to lock the nut 98 in adjusted position longitudinally of said screw.

It will be seen that when the screw 99 is rotated to change the adjustment of the bar 93, the movement of the nut 98 caused by said rotation will cause a corresponding movement of the arm 91 (shown at the lower part of Fig. 7) and as this arm is secured fixedly to the transverse shaft 90, an equal and similar movement of the other arm 91 will be produced, whereby the bar 93 will always be maintained parallel with the upper plane surface of the table 29.

Means are provided for raising the bar 93 out of contact with the top surface of the sheets in order to permit the suction head 53 to remove the top sheet, and for this purpose, the lever 100 has secured thereto (see Fig. 5), the upper end of a link 102, the lower end of which is connected with an operating lever 103, rotatably mounted upon a stub shaft 104. The lever 103 carries a cam roller 105 which engages with the peripheral surface 106 of the cam 61 adjacent to the side frame 21, said surface having a throw portion 107 which is adapted to raise the lever 100 and bar 93 at the proper predetermined intervals; the major portion of the cam surface 107 allowing the bar 93 to fall and rest upon the top sheet of the stack. A spring 108, connected with the end of lever 103, serves to assist in raising the parts.

One of the rock shaft carrying arms 55 is provided with a forwardly directed extension 110 having pivotally secured thereto, the upper end of a rod 111, the lower end of said rod being cut away to provide a tooth or shoulder 112 which is adapted, under certain conditions, to engage with a plate 113 carried by the forward end of a lever 114. The lever 114 is rotatably mounted upon the shaft 25 hereinbefore referred to, which shaft it will be remembered has secured thereto the pinion 26 which meshes with the rack 27 for elevating the table 29. The lower end of the rod 111 passes through an elongated slot 115 of the lever 114, and the rod has secured between its ends a weight 116 which normally holds the shoulder 112 out of engagement with the plate 113. The rear end of the lever 114 is provided with a lug 114ª carrying an

adjustable screw 114[b] which is normally held against a portion of the bracket 23 by means of a spring 118 connected to the rear outer end of the lever, to thereby always maintain the lever in the proper position to be engaged by the rod 111. The rear end of the lever 114 carries rotatably a pawl 117 (Fig. 3), the toothed end of which is normally held in engagement, by gravity, with the one-way ratchet wheel 119. A second pawl 120, mounted on a transverse shaft 120[a], is provided for holding the ratchet wheel 119 against movement in a clockwise direction (Fig. 3) during the oscillation of the pawl 117. The pawl 120 is provided with a handle 121 to throw the same out of engagement with the ratchet wheel, whenever it is desired to lower the table 29 manually by means of the hand wheel 122 secured upon the outer end of the shaft 25. To avoid the necessity for manually operating both of the pawls 117 and 120 out of engagement, when it is desired to lower the table 29 manually, the pawl 117 is provided with an upwardly extending arm 117[a], having a socket 117[b], in which a pin 120[b], projecting from the pawl 120, engages to cause the pawl 117 to be thrown out when the pawl 120 is thrown to inoperative position.

The lower front end of the lever 100 is provided with an adjustable screw 123, (Fig. 5) which is adapted, whenever the top surface of the stack of sheets falls below a predetermined level, to engage with the rod 111 and force the same against action of the weight 116 in a forward direction so as to bring the shoulder 112 into engagement with the plate 113. As the rod 111 is carried by the vertically reciprocating arms 55, it will be seen that when the shoulder 112 engages with the plate 113, the lever 114 will be caused to rock upon its pivot and thereby cause the pawl 117, carried by the rear end of the lever to rotate the ratchet wheel 119 and thus elevate the table and stack of sheets. As soon as the top surface of the pile of sheets passes above a predetermined level, the screw 123 will be moved out of engagement with the rod 111, thereby permitting disengagement of the shoulder 112 and plate 113, and in the further operation of the machine the rod 111 will merely reciprocate idly in the slot 115 without causing any movement of the lever 114 until the top of the stack again drops below its lower predetermined level; this idle movement of the rod 111 continuing until it is again engaged by the screw 123.

Means for preventing dragging of sheets (Figs. 4, 12 and 13).

In order to prevent the uppermost sheets of the stack from being blown away by the air currents which issue from the slot 47 and apertures 48 at the time when the suction head 53 is not in contact with the sheets, and also to assist in the separation of long sheets from the stack, the following means are provided: rotatably mounted in a pair of bearings 125, 126 (see Fig. 12) provided in the bracket 44 is an air manifold 127, having a plurality of upwardly extending outlets 128, to which are connected the curved nozzles 129, having their front ends terminating adjacent to the upper surface of the sheet stack near the front thereof. The manifold 127 has one end thereof extended through the bracket 126 to provide a valve 130, in the form of a rearwardly extending arm provided with a conduit 131. Air is admitted into the valve 130 through an aperture 132 (Fig. 13) in the side face of said arm, which aperture furnishes communication between the branch conduit 131 and a conduit 133, provided in the bracket 126; the lower end of the conduit 133 having secured thereto a pipe 134 which connects to the blower side of the pump 50 through the valve 300 to be presently described.

The following means are provided for oscillating the manifold 127 so as to swing the nozzles 129 to the dotted line position shown in Fig. 10 out of the path of movement of the top sheet as it is raised by the suction head and for also actuating the valve 130 intermittently so as to supply the current of air through the nozzles 129 only at the time when the nozzles are in the full line position and in contact with the top surface of the stack of sheets. The left hand end (Fig. 12) of the manifold 127 is extended beyond the bearing 125 and is provided with a laterally extending bifurcated arm 135 to which is pivotally secured the upper end of a cam lever 136, (Fig. 4), the lower end of which is bifurcated to straddle the cam shaft 58. A cam roller 137, mounted upon the cam lever 136 adjacent to its lower end, is adapted to be engaged by a cam 138 secured to the cam shaft for raising the cam lever at predetermined intervals. The cam 138 is so constructed and arranged that the nozzles 129 will be thrown to the dotted line position only during the initial raising of the top sheet and will be returned to full line position in contact with the stack just as the forward swinging movement of the suction head begins. When the cam lever 136 is lowered by the cam 138, the aperture 132 of the branch conduit 131 will be brought into alignment with the conduit 133 of the bracket 126, thus permitting the air from the pipe 134 to pass to the air manifold 127 and out through the nozzles 129, blowing down upon the stack and between it and the sheet that is being carried away by the suction head, thereby causing a current of air to pass under the sheet and prevent dragging of the rear end thereof upon the top surface of the stack.

Glue applying mechanism (Figs. 1, 3, 4 and 5).

The following means are provided for ap-

plying the glue or other adhesive to the sheets; a glue pan 140 is detachably mounted within a heating jacket 141; brackets 142 being suitably secured to and extending downwardly from the jacket 141. The brackets 142 are guided for up and down movement between the frames 21, 22, the latter being provided with suitable guiding members 143, in which are engaged the ends of a transverse tie rod 142ª which passes through and connects the upper ends of the brackets 142. A transverse shaft 145 of square cross section has mounted thereon, adjacent to each of the frame members 21, 22, a crank arm 146, said crank arm being provided with a boss which projects into the slots 144 formed at the lower ends of the brackets 142, and also serves to guide said brackets 142 in their vertical movement. The crank arms 146 are in the form of a yoke, (Fig. 1) between the arms of which are pivotally secured the lower ends of the links 147; the upper ends of said links being connected to the tie rod 142ª. The shaft 145 extends outwardly beyond the frame member 21 and has secured to its outer end a hand lever 148 (Fig. 3) for the purpose of raising and lowering the heating jacket and glue pan.

A glue roller 149 is mounted rotatably in suitable bearings provided in the glue roller adjusting levers 150 (see Fig. 14), each of said levers being pivoted at one end, as at 151, to the side frames, and being provided at the other ends with the headed screw 152, which engages a suitable abutment on the side frames for the purpose of adjusting the height of the glue roller relatively to the glue applying roller 153. The glue applying roller 153 is mounted above the glue roller 149 in suitable bearings in the frame members 21, 22, with its periphery in contact with said glue roller 149, and suitable mechanism to be hereinafter described is provided for driving the glue applying roller at a greater rate of speed than the feed rollers 66, 67.

A guide plate 154 is provided to guide and direct the sheet as it passes from the feed rolls, towards and into contact with the glue applying roller 153; said guide plate having its front face curved to extend about a portion of the periphery of the roller 153 to direct the sheets into contact with said roller. In order to insure the gumming of the forward edge of the sheet the lower edge of the curved front face of the guide plate terminates below the horizontal plane in which the axis of the roller 153 lies, and as the sheet is fed to the roller from right to left (in the drawing) that portion of the periphery of the roller lying in the same horizontal plane as the axis will, as clearly shown, extend to the right beyond the line along which the first contact of the sheet with the roller occurs. This will cause a sufficient bending back of the sheet, as it is fed to and carried around by the glue applying roller, to insure an appreciable pressure of the sheet against the roller, thereby securing an efficient coating of the entire sheet. As the sheet is carried upwardly around the roller 153, the straight edge formed by the intersection of the lower and front walls of the guide plate 154 will exert a downward pressure upon the sheet which will cause the sheet to be pressed pressed against the glue applying roll. A guard plate 155 is interposed between the lower feed roll 67 and the glue roller 149, to prevent spattering of glue upon the feed rolls. The upper feed roll 66 and guide plate 154 are mounted in a movable frame. work, consisting of the guide plate 154 and a pair of adjustable levers 156, the front ends of which levers are bifurcated as at 157 to straddle the reduced end of the bearing 158ª for the shaft 158 of the glue applying roller. The length of the arms formed by the bifurcated ends 157 is such as to bring the outer ends of such arms beyond the center of the bearing 158ª, and one of such arms is provided with a plunger 159 which is pressed outwardly of the arm towards said bearing so that when the bifurcated end of the lever 156 is placed over the bearing, it will be retained in position by the plunger 159; a spring 160 being provided to normally hold the plunger in its outer position. Adjustment screws 161 and 162 are provided; the screw 161 serving to adjust the position of the feed roller 66 relatively to its co-operating roll 67, and the screw 162 serving to adjust the position of the plate 154 relatively to the glue applying roll.

Means for removing the sheets from the gluing mechanism (Figs. 1, 14 and 15).

The glue applying roller 153 is provided with a plurality of grooves 163 (Fig. 1) in which the lower ends of the sheet removing fingers 164 project. The sheet removing or pickoff fingers 164 are mounted at spaced intervals upon a rod 165 (Fig. 14) detachably mounted between the side frames 21, 22. Each of the pick-off fingers 164 is in the form of a plate which extends longitudinally of the machine with the flat sides thereof in vertical planes. The front end of each plate is cut out, as at 166, to straddle the rod 167 which extends between and is secured to the side frames 21, 22. The rear ends of the plates 164 are curved, as at 168, to direct the sheets after they have been removed from the glue applying roller 163 onto a conveyor 170; a pair of rollers 169 (Fig. 4) being mounted upon brackets 169ª, secured to the rod 167 to hold the sheets in contact with the upper flight of the conveyor.

In order to insure that the sheets will be carried along by the conveyor, we have provided means for blowing them onto the con-

veyor belt as they leave the pick-off fingers 164. The following means is provided for this purpose: carried by the upper end of the frame 22 is a bracket 171, (Fig. 15), to which is connected a pipe 172, leading through chamber 302 to the blower side of the pump 50. A spring pressed centering plug 173 is slidably mounted for longitudinal movement within the bracket 171, and said plug is drilled out, as at 174, to provide a conduit which communicates with a conduit 175 in said bracket; the tapered end of the spring pressed plug 173 engaging within a co-operating center provided in the rod 167. The rod 167 is drilled to provide a small conduit 176 with which the conduit 174 communicates, and the conduit 176 branches laterally a short distance from the end of the rod to connect with a conduit 177, provided in a bracket 178. The bracket 178 extends downwardly and has secured in an apertured boss at the lower end thereof, a hollow tube or shaft 179, the other end of which tube is supported by a bracket 180 (see Fig. 1) located near the center of the machine. Adjacent to the bracket 180, the tube 179 has mounted thereon, a nozzle carrying member 181, which furnishes communication between the hollow tube 179 and a pair of nozzles 182, suitably secured to the nozzle carrying member; it being understood that suitable conduits are provided in the nozzle carrying member and the side walls of the tube 179 to connect the nozzles with the tube. The member 181 is also provided with a radially extending hollow finger 182^a which terminates in a blowing nozzle. The front of the nozzles 182 terminate close to the upper surface of the conveyor 170, at a point adjacent to the upper edge of the fingers 164, and the air issuing continuously from said nozzles will force the sheets down into contact with the conveyor.

Positive air controlling means (Figs. 2, 5, and 18 to 20 inclusive.)

As machines of the character herein described must handle many different grades of paper, it is desirable to interpose valve means, between the blower side of the pump and the various nozzles or other blowing devices used in the machine, for the purpose of regulating the amount of air according to the thickness or weight of the paper. While an ordinary needle or gate valve may be employed for this purpose, such valves are not entirely satisfactory because it is not possible to combine with valves of these types, reliable indicating means which will enable the operator to set the regulating valve as required. Consequently the operator, when changing from one job to another, is compelled to adjust the valve frequently until the proper volume of air is secured. In order to avoid the necessity for this frequent manipulation of the valve and to provide a means which may be instantly adjusted by a single setting to secure a predetermined air pressure or volume in the blowing devices we provide the following construction: the bracket 23 adjacent to the side frame 21 is cored out to provide a chamber 302, (Fig. 5) to which the air from the blower side of the pump is led by the pipe 303 suitably connected to the bracket 23 and the pump. The upper end of the chamber 302 is closed by a combined valve casing and cover 304 having a pair of similar bosses 305, 306 (Fig. 2), in which the valves 300 and 301 respectively, are rotatably mounted. The valves 300 and 301 are of similar construction and consist of a cylindrical plug having a bore 309 (Figs. 18 to 20) extending inwardly from one end thereof and two sets of circumferentially spaced holes 307, 308 which communicate with the bore 309. The holes 307 are of different diameters and are adapted to be brought into alignment with a hole 310, provided in the cover 304 to permit the air from the pump to flow to the bore 309. The holes 308 are all of the same diameter and are so located upon the valve plug that a hole 308 will be brought into alignment with the bore 311, passing through the inclined boss 312 when its corresponding hole 307 is in alignment with the hole 310; it being understood that for each hole 307 there is a corresponding hole 308, located at a distance of 180° about the circumference of the valve plug, and each set of holes being spaced from each other longitudinally of the plug so as to permit them to be brought into registry with their co-operating holes 310 and 311. The valve plugs 300, 301 project outwardly of their respective bosses and have secured thereto, the actuating knob or handles 313 and 314 respectively, each of said knobs being provided with an indicator or pointer 315 adapted to cooperate with an index plate 315^a secured to the cover 304. A plurality of recesses 316 are formed in each valve plug to receive the end of a spring pressed plunger or stop 317 for holding the plugs in their different adjusted positions, there being a recess 316 for each co-operating pair of holes 307, 308. The diameter of the holes 307 are proportioned to secure the delivery of a predetermined volume or pressure of air to the blowing devices for the different thickness or weights of the paper usually employed. Assuming that the lightest grade of paper is to be used the knobs 313 and 314 are adjusted to bring the smallest holes 307 in alignment with the hole 310, the air will flow from the chamber 302 through holes 310 and 307 to the bore 309, thence through the corresponding hole 308, bore 311, and pipes 46, and 134 respectively, to the slot 47 and nozzles 129. If a heavier grade of paper is to be used, the operator turns the knobs 313, 314 to the

proper graduation for the particular paper, the plungers 317 snapping into the recesses 316 to hold the valve plugs against accidental movement. It will thus be seen that with the above described construction the regulation of either of the air supply valves necessitates only a single movement thereof by the operator to secure a definite predetermined valve opening. While the provision of four different sized valve openings will be sufficient for the ordinary requirements, it will be understood that any desired number or size of valve openings may be used.

Conveyer (*Figs. 3, 4 and 5*).

The conveyor 170 is in the form of an endless belt which extends horizontally towards the rear of the machine above the label carrying table 29. The front part of the conveyor is trained about and driven by the conveyor driving roller 183, which is mounted for rotation in suitable bearings, provided adjacent to the ends of a pair of swinging arms 184, idler rolls 185 and 186 also being carried by said arms to guide the flights of the conveyor. The arms 184 are pivotally mounted to the side frames 21, 22 and are so arranged that the front portion of the conveyor may be swung upwardly so as to permit ready access to the glue rollers and feed rollers for cleaning the same; clamps 184ª are pivotally mounted to the side frames and are adapted to be swung over the forward ends of the swinging arms 184 to lock said arms in operative position. From the description of the manner of mounting the fingers 164, it will be apparent that these parts may also be removed from the machine. The manner of mounting the paper feed roll 66 and tension plate 154 upon the detachable arms 156 also permits the last mentioned parts to be removed, thus enabling all of those parts which would otherwise prevent access to the glue applying roller to be removed for the purpose of readily cleaning the same.

As the movable front portion of the conveyor would, because of its weight, be difficult to throw upwardly to its inoperative position, counter balancing means have been provided to assist in lifting these parts. The rear end of the conveyor is trained about a roller 190, supported at the end of a pair of horizontally extending tubes 191, and each of these tubes have secured therein a spring 192 to one end of which is secured a cable 193, the other end of said cable being anchored, as at 194, to the brackets 184. Suitable tension is placed upon the springs 192, when the ends of the cables are fastened at 194, to cause the springs to exert a sufficient pull upon the cables to offset the weight of the parts when the same are being swung to the upper inoperative position.

As gumming machines of the character herein disclosed are used with many different types of secondary machines, we have made the delivery end of the conveyor adjustable in height. Each of the tubes 191 has mounted slidably thereon, a sleeve 195, provided with a set screw 196 for holding the sleeve in adjusted position. A supporting rod 197 is provided for each of the tubes 191, the upper end of the rod being secured in any suitable manner in the sleeve 195 and its lower end being pivotally secured to a tie rod 199 extending transversely between the side frames adjacent to the base 20. The manner in which the height of the conveyor may be adjusted will be readily understood; the sleeves 195 being slid longitudinally of the rods 191 and the set screws 196 tightened to hold the parts in an adjusted position.

Driving mechanisms (*Figs. 1, 2 and 3*).

Power for driving the machine is preferably supplied by a motor 200, mounted upon the bracket 198 pivotally mounted on the tie rod 199 and provided with a driving pulley 201, about which is trained a belt 202, which drives, by means of the pulley 203, drive shaft 204. On the end of drive shaft 204, opposite the pulley 203, is secured a pinion 205 (Fig. 3) which meshes with and drives a gear 206, mounted upon a stub shaft 207. A pinion 208 is connected with the gear 207 to turn therewith, and said pinion meshes with and drives a gear 209, loosely mounted upon the shaft of the lower feed roller 67. A second gear 210 is fixedly mounted upon the shaft of the feed roller 67 and drives, by means of an idler gear 211, a gear 212 mounted upon the shaft 158 of the glue applying roller 153. A separable clutch 213, interposed between the gears 209 and 210, is provided with a manually operatable lever 214 for throwing the clutch into or out of engagement, thereby permitting all of the driving mechanism above and including the feed roller 67 to be thrown out without stopping the entire machine. The gear 212 is fixed upon the shaft 158 of the glue applying roller, and is provided with a clutch face 212ª with which is adapted to be engaged a cooperating clutch face 215ª, provided upon a gear 215 loosely mounted on the shaft 158. The gear 215 meshes with and is adapted to drive a gear 216, secured to the shaft of the conveyor roller 183, and is provided with a grooved hub 217 with which is engaged one end of a two-armed clutch shifting lever 218, pivoted, as at 219, in the bracket 220, secured to the side frame 21, and a spring pressed plunger 219ª urges the lever 218 to the position in which the clutch faces 212ª and 215ª are in engagement. The lower end of the lever 218 is provided with a cam roller 221 which projects into the path of movement of a cam throw 222, formed upon a cam 223, secured to the cam shaft 58; said cam throw being

formed to throw said lever upon its pivot 219 to disengage the clutch faces 212ª and 215ª. The cam 223 is provided with an annular T slot 223ª extending around the outer side of the cam and in which the bolt 223ᵇ is engaged for connecting the cam throw 222, adjustably to the cam. A latch lever 260 pivotally secured to the bracket 220 is provided at its lower end with a roller 261, which projects into the path of movement of a second cam throw 223ᶜ, adjustably secured to the cam 223 in the elongated slots 223ᵈ. Said latch lever is provided between its ends with a latch plate 262 and a spring 263 pulls the lever 260 forwardly so that, when the lever 218 is swung inwardly by the cam throw 222 to disengage the clutch, the latch plate will engage the lever 218 to hold the clutch out of engagement. The cam throw 223ᶜ is so located upon the cam shaft 58 with respect to the one-way knife clutch, to be hereinafter referred to, that it will engage the latch lever 260 to release the lever 218 and permit the engagement of the clutch faces 212ª, 215ª just as the cam shaft begins to rotate, said clutch faces remaining in engagement until the cam throw 222 throws the lower end of the lever 218 inwardly to disengage them.

During the time the clutch faces are in engagement the rear face of the latch plate 262 is held by the spring 263 against the forward face of the lever 218, as shown in dotted lines in Fig. 17, and when the lever 218 is moved inwardly to the full line position, the latch lever is swung rearwardly by the spring to cause the latch plate to move in front of the lever 218 and thereby hold the clutch faces out of engagement as heretofore pointed out. The cam throws 222 and 223ᶜ are arranged to throw the levers 218 and 260 respectively a short distance beyond the positions shown in Fig. 17, to provide sufficient clearance between the latch plate and lever 218 at the time either of these parts are moving from one position to the other. The wide range of adjustment of the cam throw 222 permitted by the annular T slot 223ª enables the extent of each intermittent movement of the conveyor to be controlled with great accuracy according to the length of the labels being gummed; it being understood that for the shortest labels the cam 222 will be placed so as to operate shortly after the cam throw 223ᶜ, while for longer labels the cam 222 will be moved to a position which will permit a longer period of engagement of the clutch faces 212ª, 215ª, and therefore a greater travel of the conveyer.

The speed of the conveyer is proportioned to the speed of the machine so that if the cam throw 222 is adjusted to permit the operation of the conveyor during substantially the entire revolution of cam shaft, the conveyor will travel a distance slightly greater than the entire length of the longest sheets or labels the machine is designed to handle. The adjustment provided for regulating the travel of the conveyer insures not only the proper drying of the sheets, but also enables the conveyer to be stopped with the sheet at the delivery end thereof in the most convenient position to be removed by the operator at the secondary machine.

The cam shaft 58 is driven by the following gearing: A gear 225 mounted upon a stub shaft secured in the side frame 21 meshes with the pinion 205 upon the main drive shaft 204, and said gear has secured to rotate therewith a pinion 226 which meshes with a gear 227, mounted to rotate loosely upon the cam shaft 58. The rotation of the gear 227 is imparted to the cam shaft by means of a one-revolution knife-clutch of the type disclosed in our co-pending application hereinbefore referred to. The details of the construction of this type of clutch need not be entered into as such clutches are well known in the art and form no part of our invention, it being sufficient to state that upon each revolution of the cam shaft, the knife-edge of the clutch shifting lever 228 engages a slidable pin 228ª and causes the gear 227 to be disconnected from driving engagement with the cam shaft. In order to prevent the inertia of the cam shaft 58 and connected parts from causing said shaft to continue its rotation after the knife clutch is disengaged, a friction brake 58ª is mounted on said cam shaft.

A gear 270 is in mesh with the gear 227 for driving the pump 50, intermediate gearing being provided between pump shaft and the gear 270.

Means for distant control (Figs. 2 and 3).

The clutch shifting lever 228 is pivoted, as at 229, to a bracket 230, and pivotally secured to the lower end of said clutch shifting lever is one end of a connecting link 231, the other end of which is pivotally connected as at 232 with a crank arm 233 secured to the shaft 120ª. The shaft 120ª has also secured thereto a lever arm 235, (Fig. 2) which is provided at its lower extremity with an aperture in which the end of a cable 236 or other connecting means is secured. The crank arm 233 is provided with a handle 237 to permit the manual operation of the link 231 and clutch lever 228. The cable 236 extends to the secondary machine to which the conveyer 170 is intended to deliver the gummed labels, and preferably such cable is connected with an operating part of such machine, so as to cause the clutch lever 228 to be automatically actuated in timed relationship therewith.

Means are also provided to permit the operator of the adjacent secondary machine to control the removal of the sheets from the stack by the suction head. This is accomplished by controlling the operation of the suction release valve 80. Upon the shaft

79 upon which the suction relief valve is fastened, is secured, upon the outside of the side frame 21, a trip dog 250 (Fig. 3) with which is adapted to be engaged the lower end of a stop rod 251 to hold the suction release valve in its opened or suction release position. The stop rod is mounted for vertical sliding movement in a pair of guides 252, 253, projecting from the side frame 21 and said rod is normally held, in a position to engage the trip dog 250, by a spring 254 coiled about said rod and confined between the guide 253 and a collar 255 secured to said rod. The upper end of the rod 251 is connected by a link 256 with one arm of a bell crank 257, the other arm of which has connected thereto, a cable 258 or other suitable means, which leads to an operating lever 259, secured at any point conveniently accessible to the operator of the secondary machine. The operating lever 259 is preferably constructed in the form of a bell crank having the cable 258 connected to one arm thereof, in such a manner that when the lever is actuated to raise the stop rod out of the path of movement of the trip dog, the cable will pass below the pivotal mounting 259^a of the lever. A stop pin 259^b is provided for limiting this movement of the lever 259 past its dead center position. While the stop rod 251 is urged by the spring 254 to normally project in the path of movement of the dog 250, and when in engagement with said dog as shown in Fig. 3 to hold the suction relief valve open, the parts are so constructed and arranged that when the stop rod is moved out of contact with the stop dog, the spring pressed plunger 83 (Fig. 6) will immediately throw the stop dog rearwardly with its upper face under the stop rod to thereby prevent downward movement of said rod until the valve 80 is actuated by the cam throw 87. This construction and arrangement prevents the operator of the secondary machine from opening the suction valve during the time the suction head is carrying a sheet from the stack to the feed rollers.

Operation.

The operation of the machine is as follows: A stack of labels 30 being placed upon the table 29, the vertically extending side bars 36 and 37 are adjusted to bring them into contact with the side edges of the stack. The hand wheel 122 is then rotated to bring the top sheet or surface of the stack in proper position with respect to the top of the front plate 43. Motor 200 is started and either the lever 237 or the cable 236 is actuated to cause the one-revolution clutch to be thrown to operative position to permit the rotation of the cam shaft 58, it being understood that the clutch 213 for operating the gumming roll has been thrown in engagement.

Rotation of the cam shaft 58 causes the cams 61 to reciprocate the crank shaft 54 vertically, and said crank shaft is also simultaneously oscillated by means of the cam 63^a and actuating link 63, thus producing a combined to and fro swinging movement and an up and down movement of the suction head. The contours of the operative cam surfaces of the cams 61 and 63^a are arranged to cause the suction head 53 to be brought into contact with the top sheet of the stack and to first raise the sheet slightly to a sufficient distance to clear the top of the brush 52, while giving the suction head a slight rearward movement just at the instant the raising of the sheet is commenced, then to swing the sheet across and upwardly over the curved feed plate 65, and pass its forward edge between the bight of the feed rollers 66, 67. Just as the sheet is engaged by the feed rollers the suction within the suction head is interrupted by the opening of the suction release valve 80 caused by means of the engagement of the cam throw 87, upon the periphery of the right hand cam 61, with the cam roller 81. Immediately before the initial raising of the sheet by the suction head the nozzles 129 are thrown forwardly out of contact with the stack by the cam 138 and rod 136, during which time the air supply to the nozzles is cut off by the valve 130; the cam 138 permits the nozzles 129 to be returned to operative position after the sheet has been given a preliminary lifting sufficient to permit the ends of the nozzles to extend beneath the sheet and rest upon the top of the stack, the valve 130 then opening to open the air supply to the nozzles. The air issuing from the nozzles 129 will be blown between the sheet being removed and the top of the stack and will raise such sheet sufficiently to prevent its rear end from dragging upon the next sheet and pulling it forwardly.

During the time the suction head is removing a sheet from the stack, the bar 93 is raised out of contact with the stack. After a sufficient number of sheets have been removed from the stack to bring the top surface thereof below a predetermined level, determined by the setting of the bar 93, and set screw 123, the set screw will engage the rod 111 and move it towards the left (Fig. 5) so as to permit the engagement of the shoulder 112 with the plate 113, thus operating lever 114, causing oscillation of the pawl 117 and therefore rotation of ratchet 119, shaft 25 and pinion 26, thereby causing the table 29 to be elevated.

The one-way knife clutch for the cam shaft 58 is so arranged that when it is disengaged the parts will stop, due to the action of the brake 58^a, with the suction head 53 in the position shown in Fig. 4 with the front end of the sheet carried thereby a short distance from the bight of the feed rolls 66,

67, and with the cam throw 223c in position to begin to engage the roller 261 of latch lever 260, as soon as the cam shaft is again rotated. If now the knife clutch is engaged either by the manual operation of the handle 237, or by the automatic operation caused by the cable 236, the cam shaft will commence to make its revolution, the suction head 53 delivering the sheet to the feed rolls (66, 67) which feed the sheet through the restricted space between the tension plate 154 and the extension fingers 65a of the feed plate 65, it being understood that the suction in the suction head is automatically broken by the operation of the suction release valve 80 just as the sheet is passed to the bight of the feed rolls.

The sheet is then carried around by the glue applying roller 153, which, as it travels with a greater speed than the feed roller, causes the adheseive to be applied with a wiping action and thereby insuring a smooth, even coating of the sheet. The sheet is removed from the glue applying roller 153 by the pick-off fingers 164 to the conveyer 170, the air from the nozzles 181a, 182 blowing upon the forward edge of the sheet to cause it to adhere to the conveyer with its gummed surface facing upwardly. Just as the cam shaft 58 begins to rotate, the cam throw 223c causes the latch lever to release the lever 218 and permit the engagement of the clutch faces 212a, 215a, thus starting the conveyer just before the front edge of the sheet is engaged by the pick-off fingers 164. The movement of the conveyer will continue until the cam throw 222 engages and oscillates the lever 218 to disengage the conveyer clutch, the latch lever 260 holding the lower end of the lever 218 inwardly until the cam throw 223c is again operative. The amount of travel of the conveyer is regulated to cause the conveyer to stop shortly after the rear edge of the sheet is free of the gum applying roller, this regulation of the conveyer travel being accomplished by setting the cam 222 in the proper place in its slot 223a. In the meantime, and while the sheet is passing through the feed rolls and around the gum-applying roller, the suction head is swung rearwardly and downwardly to remove another sheet from the stack and carry it upwardly over the feed plate 65, the machine being stopped by the disengagement of the one-revolution clutch of cam shaft 58, just as the suction head again reaches the position shown in Fig. 4. Any tendency on the part of the sheets to curl forwardly over the top of the pick-off fingers is checked by the air currents which issue from the nozzles 181a, 182, said air currents blowing the sheet into contact with the conveyor, thereby insuring a positive and reliable removal of the sheets by the conveyor and preventing choking or jamming of the gummed sheets between the conveyor and stripping fingers.

When it is desired to clean the gum applying roller, the operation of the machine is stopped, clamps 184a are released and the arms 184 swung upwardly; the curvature of the front faces 168 of the pick-off fingers about the front end of the conveyer being such as to cause this end of the conveyer to also swing the pick-off fingers upwardly about the rod 167 as a pivot. The pick-off finger assembly or frame is then removed, thereby permitting ready access to the gum applying roller.

The handle 148 is manipulated to lower the glue pan 140 thus carrying the glue roll 149 out of contact with the glue applying roll 153 and clutch 213 is then disengaged to permit the free rotation of the gum applying roller.

While we have described our invention as exemplified by a gumming machine, it will be obvious that many of the principles, of construction and operation herein disclosed are applicable generally to machines for handling paper irrespective of the particular treatment to which the paper is subjected. It will also be understood that many changes, variations and modifications of the constructional details of the machine herein disclosed may be resorted to without departing from the spirit of our invention.

We claim:

1. In a gumming machine, a support for a stack of sheets, a suction head movable to and from said stack for removing and transferring the uppermost sheet from said stack, a plurality of nozzles for directing a current of air between the sheet being removed and the top surface of the stack, and means to move said nozzles out of the path of movement of said suction head during the initial movement of said head.

2. In a gumming machine, a support for a stack of sheets, a suction head movable to and from said stack for removing and transferring the uppermost sheet from said stack, a plurality of movable mounted nozzles adjacent to the top surface of said stack, means to hold said nozzles normally in juxtaposition to said surface, and means to move said nozzles away from said surface as said suction head engages the top sheet of said stack.

3. In a gumming machine, a plurality of air blowing nozzles for assisting in the feeding of said sheets, a pump for supplying air to said nozzles and a valve having a plurality of set positions interposed between said pump and nozzles, said valve having a different sized valve opening corresponding to each of its set positions for insuring a definite air current through said nozzles for each of said positions.

4. In a gumming machine, a plurality of air blowing nozzles for assisting in the feed-

ing of said sheets, a pump for supplying air to said nozzles, and a valve interposed between said pump and nozzles for regulating the amount of air flowing to said nozzles in accordance with the nature of the sheets to be fed, said valve including means for holding it in any of a plurality of set positions, and to permit different predetermined amounts of air to flow to said nozzles, and means associated with said valve for indicating the various set positions thereof.

5. In a gumming machine, a table for supporting a stack of sheets, a suction head for removing the uppermost sheet from said stack, operating means for said suction head, and table elevating means for causing the top surface of said stack to be maintained between predetermined levels, said table elevating means including a bar extending across said table in spaced parallel relationship therewith, connections between said table elevating means and operating means to cause said bar to be moved towards and from the top surface of said stack in timed relationship with the movement of said suction head, and means to adjust said bar relatively to said table, including means to maintain it in parallelism with said table in all its adjusted positions.

6. In a gumming machine, a table for supporting a stack of sheets, a feeding mechanism for removing the uppermost sheet from said stack, a movably mounted plate located at the front of said stack and having its upper end terminating adjacent to said uppermost sheet and means for adjusting the height of said plate relatively to said stack.

7. In a gumming machine, a pair of side frames, a table for supporting a stack of sheets mounted between said side frames, feeding mechanism for removing the uppermost sheet from said stack, a plate movably mounted between said side frames in contact with the front edge of, but unsecured to said table, said plate being adapted to engage the front edge of the sheets of said stack and having its upper edge terminating adjacent said uppermost sheet, and means extending outwardly beyond said side frames for moving said plate relatively to said table and stack and adjusting the height of said upper edge thereof.

8. In a gumming machine, a pair of side frames, a table for supporting a stack of sheets mounted between said side frames, feeding mechanism for removing the uppermost sheet from said stack, a plate movably mounted between said side frames in contact with the front edge of but unsecured to said table, said plate being adapted to engage the front edges of the sheets of said stack and having its upper edge terminating adjacent said uppermost sheet, means extending outwardly beyond said side frames for moving said plate relatively to said table and stack and adjusting the height of said upper edge thereof, and indexing means for indicating the adjusted positions of said plate.

9. In a gumming machine, a pair of side frames, a table for supporting a stack of sheets mounted between said side frames, feeding mechanism for removing the uppermost sheet from said stack, a plate extending between said side frames to contact with the front edges of said table and stack, means for mounting said plate on said side frames for limited vertical movement relatively to said table and stack and means for adjusting the height of said plate.

10. In a gumming machine, a support for a stack of sheets, a suction head for removing one sheet at a time from said stack, operating means for imparting a combined reciprocating and oscillating movement to said head and means for permitting universal adjustment of said head relatively to the uppermost sheet of said stack.

11. In a gumming machine, a support for a stack of sheets, a suction head for removing one sheet at a time from said stack, operating means for imparting a combined reciprocating and oscillating movement to said head and means for permitting adjustment of said suction head in the directions of both its reciprocating and oscillating movements.

12. In a gumming machine, a suction head for removing the outermost sheet from said stack, a rock shaft upon which said suction head is mounted, means for imparting to said rock shaft and suction head a combined reciprocating and oscillating movement and an arm secured to said rock shaft for preventing vibration of said suction head, and means cooperating with said arm to produce a slight rearward movement of said suction head substantially parallel to the plane of said outermost sheet.

13. In a gumming machine, a framework, a rock shaft mounted for rotary and reciprocatory movement relatively to said framework, a suction head carried by said rock shaft, for removing the outermost sheet from said stack, means for oscillating and reciprocating said rock shaft and the suction head carried thereby, and means to prevent vibratory movement of said suction head, as it is moved into engagement with said sheet, comprising an arm secured to said rock shaft and adapted to engage a stationary abutment of said framework.

14. In a gumming machine, a framework, having an abutment, a rock shaft mounted for oscillating and reciprocating movement relatively to said framework, a suction head for removing the outermost sheet from said stack, carried by said rock shaft, means for oscillating and reciprocating said rock shaft, and suction head, and an arm secured to

said rock shaft and adapted to engage said abutment when said suction head is moved into engagement with said sheet, said arm and abutment being provided with co-operating cam surfaces constructed and arranged to produce a slight rearward movement of said suction head simultaneously with the beginning of the movement of said rock shaft and suction head.

In testimony whereof we have hereunto set our hands.

MARTIN FEYBUSCH.
PAUL W. FLEISCHER.