Feb. 14, 1939. J. L. OBERENDER 2,147,541

PRINTING ATTACHMENT FOR ENVELOPE MACHINES

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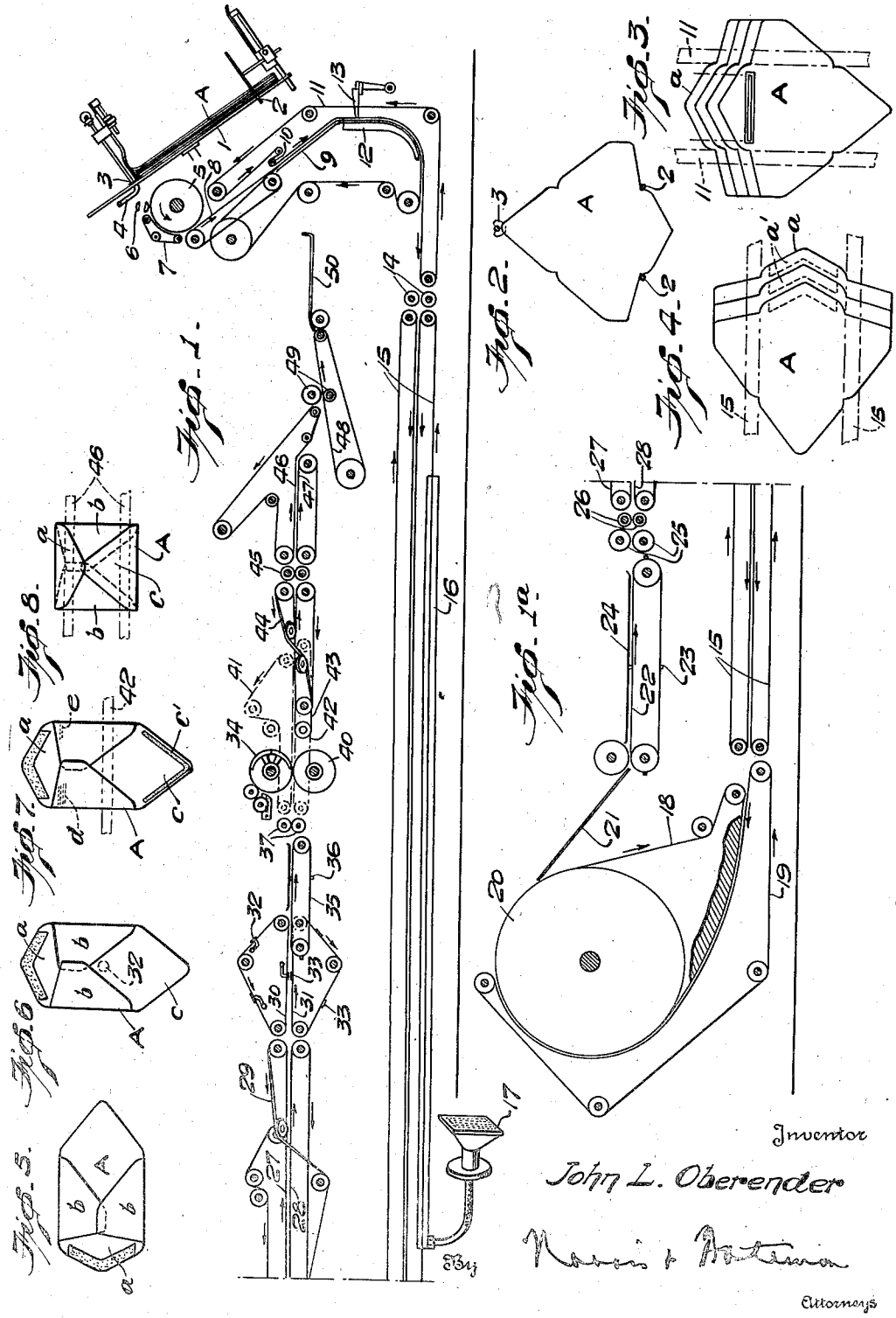


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 8.

Fig. 7.

Fig. 6.

Fig. 5.

Fig. 1a

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PRINTING ATTACHMENT FOR ENVELOPE MACHINES

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Fig. 9.

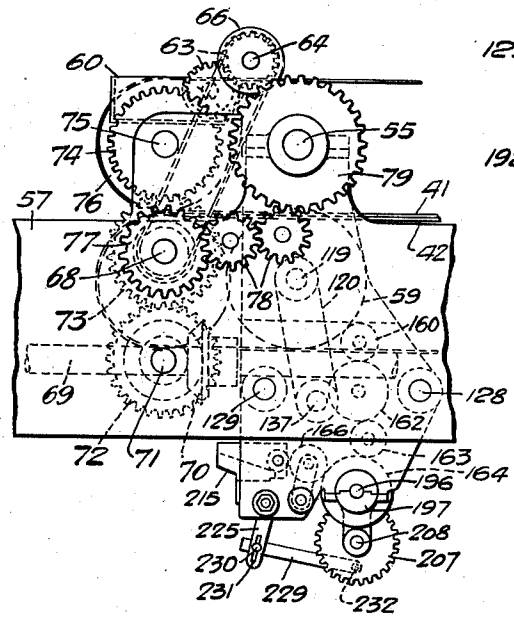


Fig. 19.

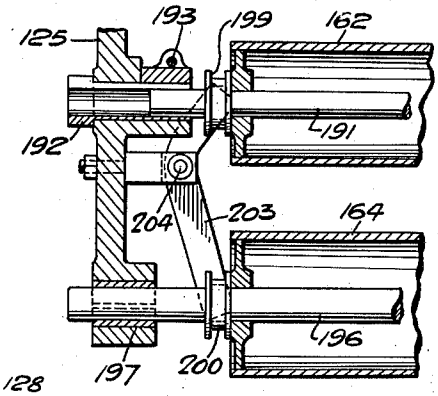
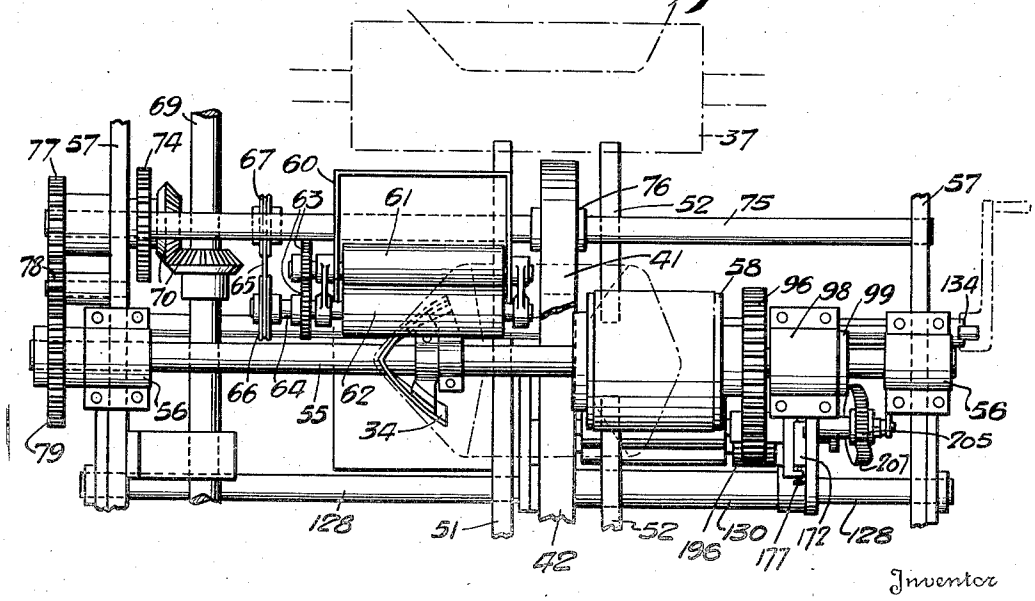


Fig. 10.



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PRINTING ATTACHMENT FOR ENVELOPE MACHINES

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Fig. 11.

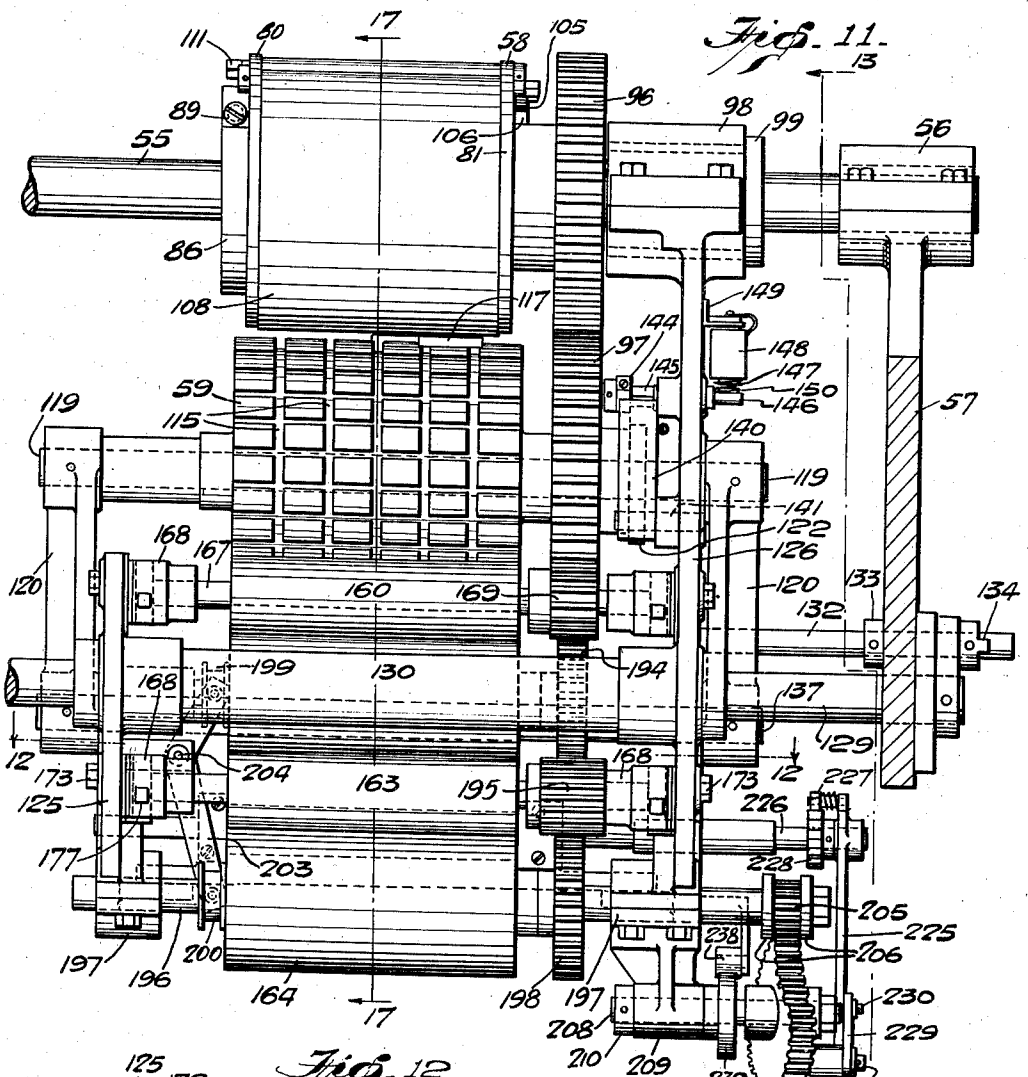
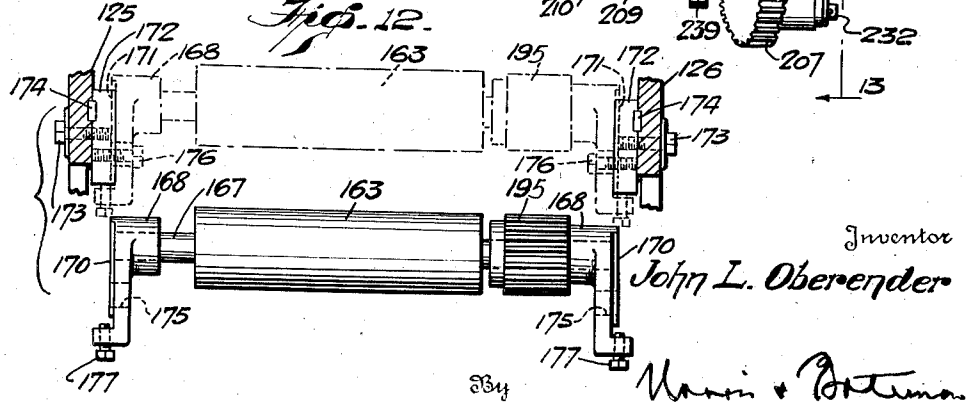


Fig. 12.



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PRINTING ATTACHMENT FOR ENVELOPE MACHINES

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Fig. 13.

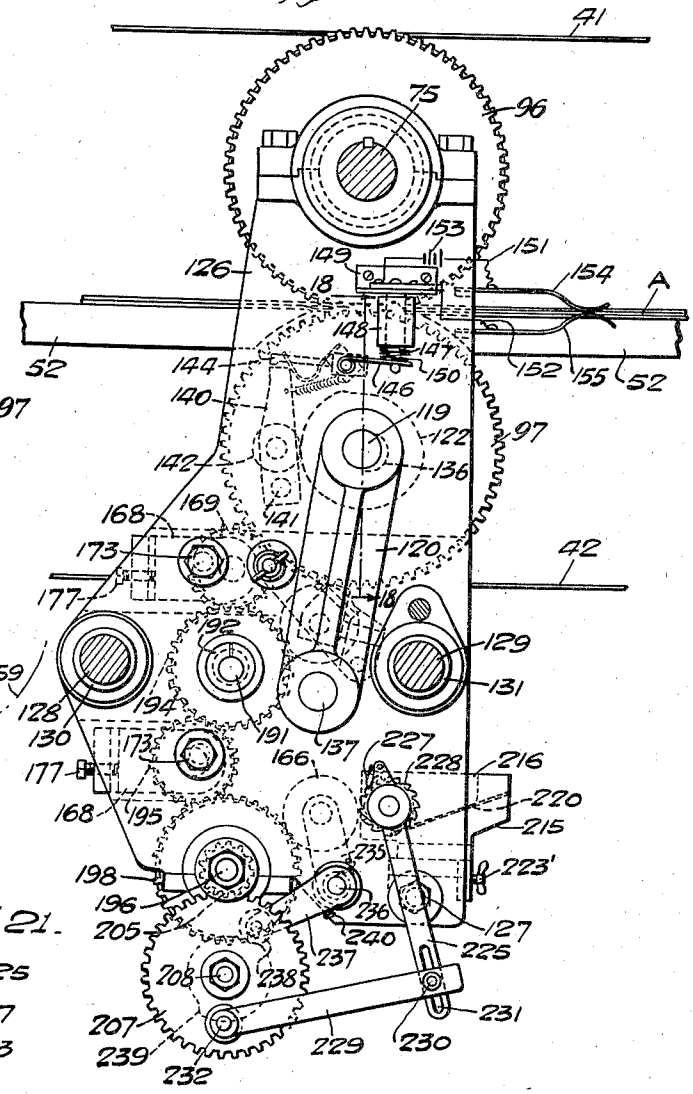


Fig. 14.

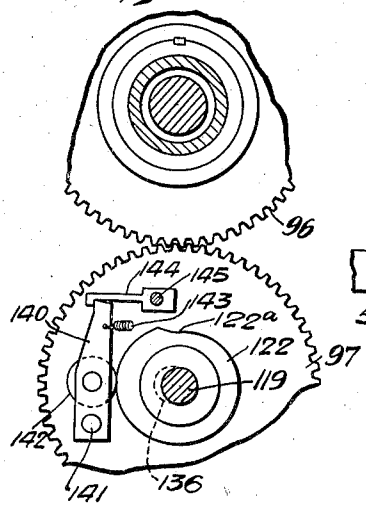


Fig. 20.

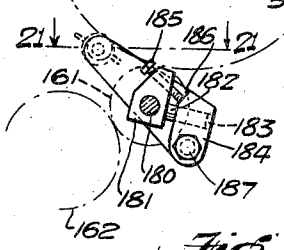
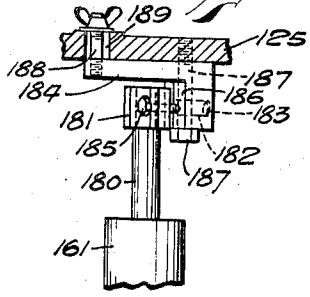


Fig. 21.



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PRINTING ATTACHMENT FOR ENVELOPE MACHINES

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Fig. 25.

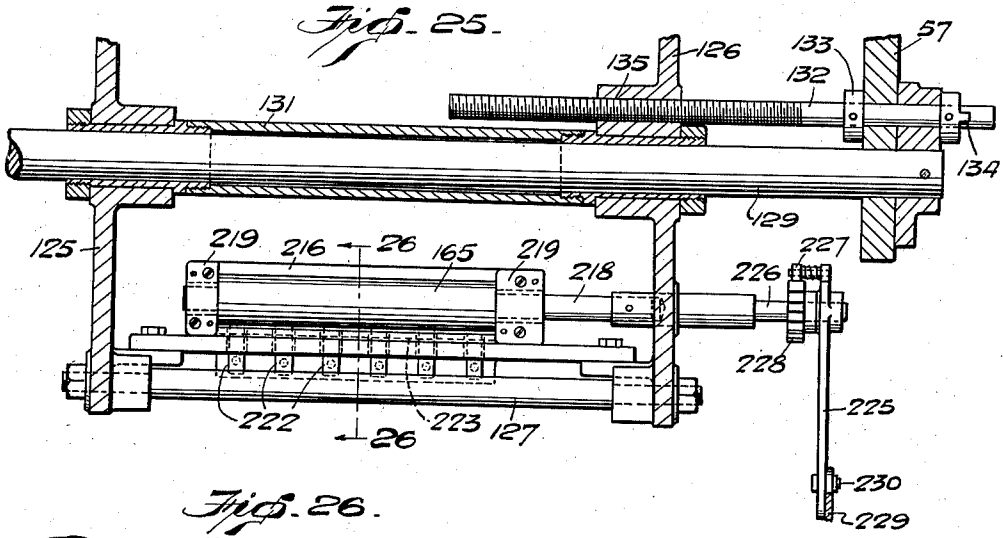


Fig. 26.

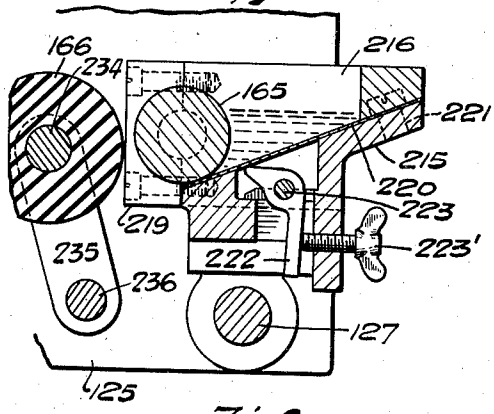


Fig. 15.

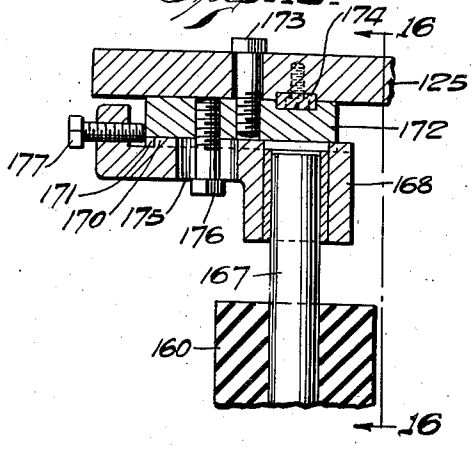
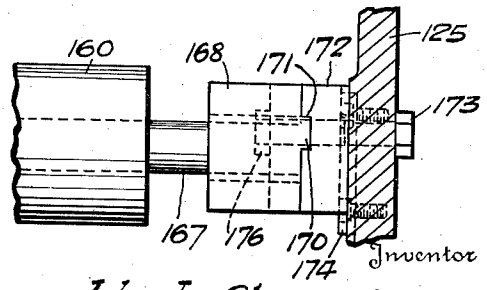


Fig. 16.



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PRINTING ATTACHMENT FOR ENVELOPE MACHINES

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Fig. 22.

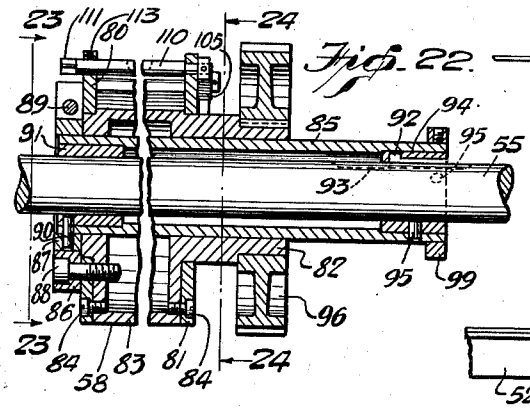


Fig. 17.

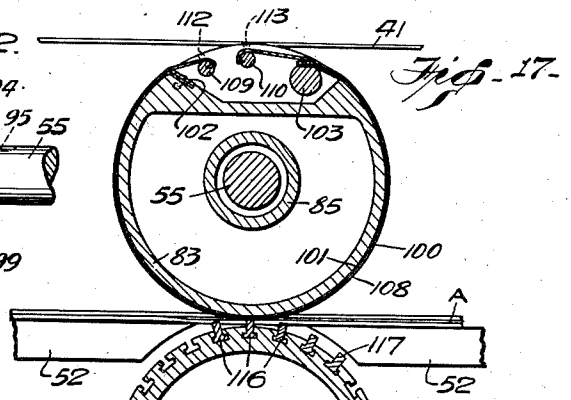
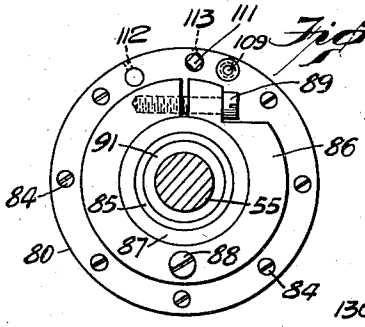


Fig. 23.



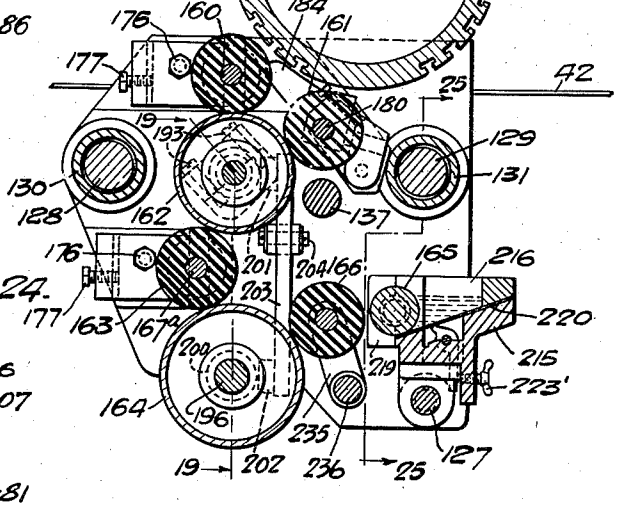


Fig. 24.

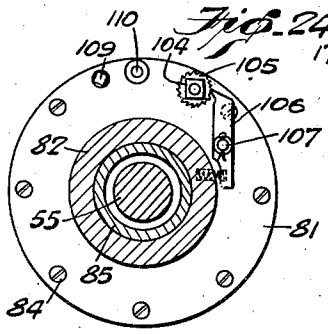
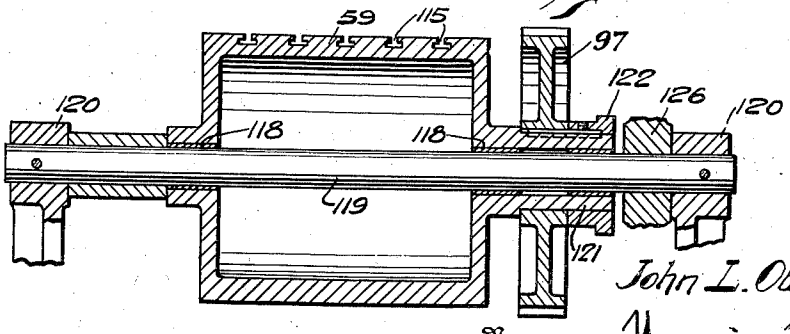


Fig. 18.



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Patented Feb. 14, 1939 2,147,541

UNITED STATES PATENT OFFICE

2,147,541

PRINTING ATTACHMENT FOR ENVELOPE MACHINES

John L. Oberender, Kingsville, Md., assignor to Oles Envelope Corporation, Baltimore, Md., a corporation of Maryland

Application March 31, 1937, Serial No. 134,165

10 Claims. (Cl. 93—73)

The present invention relates to improvements in envelope machines, and more especially to those of the class adapted to make envelopes of the diagonally seamed type, and the primary object of the invention is to provide a printing attachment for such machines which enables one side of the envelope blanks to be printed while gum is applied simultaneously to the opposite side of the blanks for pasting the diagonally seamed flaps.

According to the present invention, the printing means is combined with said gum applying means to form a unit in which the printing and gum applying means are synchronized, thus enabling each envelope blank to receive gum for the pasting of its diagonal seams and, simultaneously, to be printed, the synchronization of the gum applying and printing means insuring the proper application of the gum and the printing to the appropriate parts of the envelope blanks.

In the preferred embodiment of the invention, the gum picker shaft which carries the pickers which apply the lines of gum to one side of the envelope blanks for the diagonal seams also carries an impression roll beneath which portions of the envelope blanks pass, and a type roll is mounted opposite to the impression roll and is connected thereto to rotate at the same surface speed therewith, so that portions of the envelope blanks passing between the impression and type rolls receive printing on one side thereof while, simultaneously therewith, other portions of the blanks are passing and receiving gum for the diagonal seams from the pickers on the impression roll shaft, such gumming and printing operations being performed as each envelope is passing once through the machine.

Another object of the invention is to provide novel and improved means, controlled automatically according to the presence or absence of an envelope blank, to prevent contact of the type roll with the impression roll in the event no blank is in printing position at the moment the printing operation is timed to take place, thereby avoiding printing on the impression roll, which would be objectionable since it would smudge the envelope blanks which subsequently come into contact with it.

Another object is to provide novel and improved means for mounting the printing attachment in the machine whereby the type roll and its cooperating impression roll and ink feeding rolls may be adjusted as a unit relatively to the path of travel of the envelope blanks to print on the desired part of the envelope blanks.

A further object of the invention is to provide improvements in the mountings and adjustments of the ink feeding elements of the printing attachment whereby more uniform feeding of ink to the type roll is attained and adjustments of these elements may be accomplished with facility.

To these and other ends, the invention consists in certain improvements and combinations and arrangements of parts all as will be hereinafter described, the features of novelty being set forth more particularly in the claims at the end of this specification.

In the accompanying drawings:

Figures 1 and 1ª collectively show diagrammatically an envelope machine to which the printing attachment according to the present invention is applied;

Figure 2 shows an envelope blank in position for feeding into the machine;

Figure 3 shows several of the envelope blanks about to receive gum or adhesive on the closing flaps;

Figure 4 shows the relation of the envelope blanks during drying of the gummed flaps thereof;

Figure 5 shows one of the blanks with its side flaps folded;

Figure 6 shows one of the envelope blanks turned;

Figure 7 shows an envelope blank after gum has been applied to the bottom flap on one side of the blank for sealing the diagonal seams and the opposite side of the blank has been printed;

Figure 8 shows the completed envelope;

Figure 9 is a side elevation of the printing mechanism or attachment provided by the present invention;

Figure 10 is a top plan view of the printing mechanism and the cooperative gumming mechanism;

Figure 11 is an elevation, on an enlarged scale, of the right hand portion of the mechanism shown in Fig. 10, as viewed from the underside in said figure;

Figure 12 is a detail horizontal section, taken on the line 12—12 in Fig. 11;

Figure 13 is a vertical section, taken on the line 13—13 in Fig. 11;

Figure 14 is a detail view of portions of the impression and type rolls shown in Fig. 13 but showing the type roll shifted out of printing position;

Figure 15 is a detail horizontal section, on an enlarged scale, of one of the bearing mountings shown in Fig. 12;

Figure 16 is a vertical section taken on the line 16—16 in Fig. 15;

Figure 17 is a vertical section taken on the line 17—17 in Fig. 11;

Figure 18 is a detail vertical section taken on the line 18—18 in Fig. 13;

Figure 19 is a detail vertical section taken on the line 19—19 in Fig. 17;

Figure 20 is a detail view of the adjustable mounting for one of the ink distributing rolls;

Figure 21 is a section taken on the line 21—21 in Fig. 20;

Figure 22 is a detail section, partly broken away, taken axially through the impression roll;

Figure 23 is a section taken on the line 23—23 in Fig. 22;

Figure 24 is a section taken on the line 24—24 in Fig. 22;

Figure 25 is a vertical section taken on the line 25—25 in Fig. 17 and

Figure 26 is a section taken on the line 26—26 in Fig. 25.

Similar parts are designated by the same reference characters in the different figures.

The present invention provides an attachment for envelope machines of the class adapted to make envelopes of the form having side flaps and top and bottom flaps all foldable against the same side of the envelope, the bottom flap being united to the side flaps by diagonal gummed seams, and it enables the gum or adhesive to be applied at one side of the envelope blank for the diagonal seams and printing to be applied at the same time to the opposite side of the envelope blank, so that these operations are performed during a single passage of the envelope blank through the machine, and the invention further provides improvements in printing mechanism which particularly adapts the same for use in an envelope machine. The preferred embodiment of the invention is shown in the accompanying drawings and will be hereinafter described in detail, but it is to be understood that the invention is not restricted to the precise construction shown since equivalent constructions are contemplated and such will be included within the scope of the claims.

The invention is shown in the present instance applied to an envelope machine of well-known construction, and it is therefore deemed sufficient, for the purposes of the present invention, to show the same diagrammatically as in Figs. 1 and 1a and to describe it briefly. It comprises a plate 1 on which a stack of envelope blanks A rest, the blanks being positioned thereon by a pair of pins 2, a separator 3 which successively separates the lowermost blank from those above it, a pivoted suction cup 4 which successively engages a corner of the lowermost blank immediately after it has been separated from the stack and presents it to a roller 5 to be engaged beneath a split presser roller 6, the rollers 5 and 6 receiving the ends of the blanks in close succession so that the blanks will be in stepped relation and revolving in a direction to carry the blanks beneath a belt 7 which advances the line of blanks around the roller 5 to a belt 8, the blanks then dropping by gravity on an inclined plate 9 beneath a roller 10 around which a pair of belts 11 travel, the blanks then passing around a guide-plate 12 and while passing this plate, the ends of the blanks having the closing flaps *a* thereon are in staggered or stepped relation and the exposed portions of the closing flaps pass a gum applying nozzle 13 as shown in Fig. 3 which applies lines of gum or other suitable adhesive *a'* to the exposed portions of the closing flaps. As the line of staggered or stepped blanks discharges from the belts 11, it passes between a pair of rollers 14 which are driven at a higher surface speed than that of the belts 11 so that the blanks are spread apart in the manner shown in Fig. 4, and the line of blanks then passes between pairs of travelling belts 15 which advance the blanks over a heater 16 for drying the lines of adhesive *a'*, this heater having a nozzle 17 connected to it and through which air enters the heater and is blown under the line of blanks to assist in drying gum or adhesive on the closing flaps thereof. The line of blanks passes from the belts 15 to pairs of belts 18 and 19, the blanks entering between these belts and being advanced by them around a roller 20 and discharging from this roller by gravity over an inclined plate 21 onto a belt 22 having pins 23 thereon which pass beneath a guide-plate 24, the belt 22 being driven at a higher speed than that of the preceding belts so that the pins 23 will engage the trailing edges of the individual blanks and advance them to a pair of scoring rollers 25 which score the blanks on the lines on which the side flaps are to be folded. The scored blanks are then advanced between a pair of feed rolls 26, driven at a suitable speed, and from these feed rolls the blanks enter between pairs of feed belts 27 and 28 with which cooperate a pair of folding belts 29 which fold the side flaps *b* onto the upper side of the blank as shown in Fig. 5. From the feed belts 27 and 28, the blanks pass between a pair of belts 30 and 31, the belt 30 carrying suction cups 32 and the belt 31 carrying plates 33 timed to register with the suction cups, each blank entering between a suction cup and cooperating plate and the suction cup having means for rotating it through a quarter turn whereby the blank will be turned from the position shown in Fig. 5 to that shown in Fig. 6. The turned blanks are transferred from the turning means just described to the gum pickers 34 which apply the line of gum or adhesive *c'* to the bottom flap *c* by a belt or chain 35 having pins 36 thereon engageable with the trailing edges of the blanks, a pair of scoring rollers 37 being located at the discharge end of the belt 35 and scoring the blanks on the lines on which the top and bottom flaps *a* and *c* are to be folded. The gum pickers 34 cooperate with a roller 40 over which the flap *c* of the envelope passes while the gum lines *c'* are being applied, and the advance of the blank through the gumming device is assisted by upper and lower belts 41 and 42 between which the blank is carried while the blank is guided by guide rails 51 and 52. The blank is received from the gumming devices by belts 43 which continue the advance of the blank, and folder belts 44 cooperate with the belts 43 and serve to fold the gummed bottom flap *c* over and onto the folded side flaps *b* and to fold the top or closing flap *a* into closed position, as shown in Fig. 8. The closed envelope then passes between a pair of feed rollers 45 and then between delivery belts 46 and 47, these belts discharging the envelopes onto a belt 48 with which a pair of presser rolls 49 cooperate and between which the gummed diagonal seams between the bottom and side flaps pass to insure adhesion, the completed envelopes being discharged by the belt 48 onto a table, stacker or other suitable receiving device 50.

The printing attachment provided by the present invention cooperates as a unit with the gumming device 34, 40 which applies the gum lines

c' to the bottom flap c of the envelope blanks. In applying the present invention to an envelope machine of the general class just described, in which the gum pickers 34 are mounted on a shaft 55 journalled in bearings 56 in the respective side members 57 of the frame of the machine, the picker shaft 55 is utilized as the rotatable support for the impression roll 58 of the printing attachment, the latter also comprising a type roll 59 which cooperates with the impression roll, the impression and type rolls and the inking devices for the latter forming a unit with the gumming device.

The gum pickers 34 receive gum or other adhesive from a receptacle 60 in which a roller 61 is immersed, this roller contacting with a roller 62 the periphery of which is located to be engaged by the gum pickers 34 as the latter rotate whereby adhesive is transferred to the gum pickers. The roller 61 is driven by gearing 63 from the shaft 64 of the roller 62, and the shaft 64 is driven by a belt 65 and pulleys 66 and 67 from a shaft 68. The shaft 68 is driven from the longitudinal drive shaft 69 by bevel gearing 70 which connects this shaft to a shaft 71 journalled in the adjacent side frame of the machine, shaft 71 having a gear 72 fixed thereon and meshing with a gear 73 fixed on the shaft 68. The gear 73 also meshes with a gear 74 fixed on a shaft 75 which is journalled in bearings in the side members of the machine frame, this shaft carrying a pulley 76 over which the belt 41 passes. The picker shaft 55 is also driven from the shaft 68 through a gear 77 fixed on this shaft, a pair of idler gears 78 mounted on the adjacent side member of the frame and a gear 79 fixed on the shaft 55, it being understood that the shaft 55 is synchronized with the passage of the envelope blanks beneath the gum pickers 34. Since the impression roll 58 is mounted on the picker shaft 55, it also will rotate in synchronism with the passing envelope blanks and at a surface speed corresponding with the speed of travel of the envelopes.

The printing attachment provided by the present invention, is adjustable in a direction axially of the picker shaft 55 in order to accommodate it to the printing of envelope blanks of different sizes or enable the printing to be done on different desired portions of the blanks. For this purpose, the impression roll 58 is splined on the picker shaft so that it will be driven thereby but movable longitudinally thereon. As shown in the present instance, the impression roll comprises a pair of heads or end plates 80 and 81 mounted in spaced relation on a flanged hub 82 and a cylindrical body 83 extends between the heads, the heads 80 and 81 being secured to the flanges of the hub and securing the cylindrical body 82 firmly in place between them by screws 84. A sleeve 85 extends through the hub and fits the shaft 55, and the impression roll is clamped frictionally to the shaft 55 by a split clamping ring 86 which fits around a ring 87, the latter fitting upon the sleeve 85. The ring 86 is fixed to the impression roll by a screw 88 which extends through the clamping ring 86 and adjacent head or end plate 80 into one of the hub flanges and is provided with a screw 89 which connects its split portions and is operative to contract the split ring on the ring 87. The ring 87 is connected to the sleeve 85 to be driven therefrom by a suitable number of pins 90 which extend radially through the ring 87 and sleeve 85, and as shown, these pins also extend into a collar 91 which fits slidably on the shaft 55. By this arrangement, by loosening the screw 89, the impression roll may be rotated relatively to the picker shaft 55 to set the type roll, which is driven from the impression roll, in proper timed relation to the envelope blanks as they pass between the impression and type rolls or to enable the printing to be done at the desired point or points in the direction of the length of the envelope blanks, and tightening of the screw 89 will clamp the ring 86 upon the ring 87 and thereby provide a frictional but firm driving coupling between the sleeve 85 and the impression roll. The sleeve 85 is splined on the picker shaft 55 by a key 92 which fits into and is slidable longitudinally in a keyway 93 in the shaft 55, this key being fixed in a collar 94 which is fitted into an end of the sleeve 85 and is fixed to turn therewith by a suitable number of radial driving pins 95. A gear 96 is keyed or otherwise fixed on the hub 82 of the impression roll, this gear meshing with a gear 97 which is fixed to the type roll and serves to drive it. The sleeve 85 is journalled in a bearing 98 which occupies a position between the gear 96 and a collar 99 which is fixed on the outer end of the sleeve 85. The impression roll is provided with a tympan 100 which may be composed of sheets of paper, fabric, parchment or other suitable flexible material which surrounds the cylindrical body 83 of the impression roll. In the present instance, the tympan comprises a sheet 101 of fabric or other suitable backing material which lies against the surface of the cylindrical body 83, one end of this sheet being fixed to the cylindrical body as by a clamping strip 102 and the other end of which is attached to a shaft 103 which is mounted rotatably in the heads 80 and 81 and is adapted to wind the sheet thereon and thereby tension it, the shaft 103 being provided for this purpose with a square or other suitable wrench receiving end 104 and having a ratchet wheel 105 fixed thereon, this ratchet wheel cooperating with a pawl 106 which is pivoted at 107 on the adjacent head 81 for locking the shaft 103 against unwinding rotation and thereby maintaining the sheet 101 in tensioned condition. The tympan also comprises an outer sheet 108 of for example paper or parchment which extends around the impression roll exteriorly of the sheet 101, this outer sheet being attached at its ends to shafts 109 and 110 mounted rotatably in the heads 80 and 81, one of these shafts having a square or other wrench receiving end 111 for rotating it to wind the sheet 108 thereon and thereby tension it, the shafts 109 and 110 being locked to maintain the outer sheet 108 under tension by set screws 112 and 113.

The type roll 59, as shown in Figs. 17 and 18, is adapted to receive printing plates or other printing elements for cooperation with the impression roll. The cylindrical periphery of the type roll may for example be provided with intersecting circumferential and longitudinal undercut grooves 115 to receive the heads of screws 116 for clamping a printing plate 117 in the desired position on the periphery of the type roll. The type roll is provided with bearings 118 which are mounted revolubly on a shaft 119, the latter being pinned or otherwise fixed at its ends in a pair of arms 120. A hub 121 extends axially from one end of the type cylinder and the gear 97 is keyed or otherwise fixed on this hub. A cam 122, the purpose of which will hereinafter appear, is also keyed or otherwise fixed on the hub 121 of the type roll.

The type roll and its cooperating inking mechanism is carried by a frame which is shiftable axially of the picker shaft 55, and the impression roll 58 is shiftable axially on said shaft and as a unit with this frame. The frame comprises a pair of side members 125 and 126 and a tie rod or bolt 127 which rigidly connects them, and the bearing 98 in which the hub of the impression roll is journalled is carried by or formed as a part of the side frame member 126, so that the impression roll may shift axially of the picker shaft as a unit with the frame 125, 126 and the type roll and inking devices. The shiftable frame is supported for such shifting movement by a pair of rods 128 and 129 which are rigidly secured in the main side frame members 57 and extend slidably through bearing sleeves 130 and 131 which extend between and are secured to the side frame members 125 and 126 of the shiftable frame. The frame carrying the type roll and inking devices is adjusted on the rods 128 and 129 by a screw 132 (Fig. 25) which is mounted rotatably in the adjacent side member 57 of the main frame and is held against axial movement by thrust collars 133, the outer end of this screw having a suitable crank or wrench receiving portion 134 and the screw being threaded at 135 into the shiftable frame member 126.

The shaft 119 on which the type roll 59 is mounted extends through a slot 136 formed in the frame member 126, and the arms 120 which carry the shaft 119 are fixed on the ends of a shaft 137 which extends through the frame members 125 and 126 and is rotatable therein, the type roll being thus mounted to swing forwardly and rearwardly relatively to the impression roll, about the shaft 137 as a center, and the slot 136 is concentric with the shaft 137.

The type roll is thus mounted for swinging movement relatively to the impression roll for the purpose of setting it in or out of printing relation therewith, and the present invention provides means for automatically setting the type roll out of printing relation with the impression roll upon failure of feed of an envelope blank to the printing mechanism. By referring more particularly to Figs. 13 and 14, it will be understood that rotation of the gear 96 in a clockwise direction and which drives the gear 97 connected to the type roll in an anti-clockwise direction, will tend to swing the type roll shaft 119 toward the left in Fig. 13 to bring the type roll into printing relation with the impression roll and to maintain it in such position, through the force of the drive between the gears 96 and 97, and while the type roll occupies that position, it will be in printing relation with the impression roll. Means is provided however for swinging the type roll rearwardly or toward the right in Fig. 13 to carry the type roll out of printing relation with the impression roll, such means comprising the cam 122 fixed to the type roll and rotatable therewith, a cam follower comprising a pawl 140 pivoted at 141 on the adjacent shiftable frame member 126 and carrying a roller 142 which rides on the cam 122 and is held in contact therewith by a spring 143, and a latch 144 which is pivoted at 145 on the frame member 126 and is engageable with the end of the pawl 140. While the latch 144 is in lifted relation with the pawl 140 as shown in Fig. 13, the pawl 140 will swing to and fro idly as the roller 142 rides on the cam 122 and the type roll will remain in printing position, but when the latch 144 is lowered into the path of the upper end of the pawl 140, the pawl 140, after the roller 142 thereon has dropped into the depression 122a of the cam, will be held against swinging movement toward the left in Fig. 14, in consequence of which the cam 122, bearing on the fixed roller 142, will swing the type roll shaft 119 toward the right, or from the position shown in Fig. 13 to that shown in Fig. 14, thereby moving the type roll out of printing relation with the impression roll.

The purpose of moving the type roll out of printing relation with the impression roll is to avoid printing on the tympan of the impression roll as would occur upon failure of an envelope blank to feed between these rolls, and the present invention provides means controlled automatically according to the presence or absence of an envelope blank, to control the position of the type roll. In the preferred construction as shown, the shaft 145 to which the latch 144 is fixed is journalled in and extends through the frame member 126 and has an arm 146 fixed on its outer end, this arm carrying an armature or core 147 of a solenoid 148, the latter being fixed to the frame member 126, as by a bracket 149. A spring 150 acts on the arm 146 to swing it in a direction to lift the latch 144 from the path of the pawl 140 while the solenoid is deenergized. The terminals of the solenoid are connected by wires 151 and 152 and a battery or other suitable source of electric current 153 to a pair of spring contact members 154 and 155 which are mounted opposite to one another in the path of the envelopes as they are about to enter between the impression and type rolls. If an envelope blank passes between the contact members 154 and 155 at the moment the depression 122a in the cam 122 is passing the roller 142, said contact members will be held out of engagement with one another as shown in Fig. 13 and the solenoid 148 will be deenergized so that the spring 150 will hold the latch 144 in its elevated position out of the path of the upper end of the pawl 140 so that the latter can swing idly and the type cylinder will remain in printing relation with the impression roll, but if no envelope blank passes between the contact members 154 and 155 at the moment the depression 122a in the cam 122 is opposite to the roller 142, the contact members 154 and 155 will engage one another, thereby completing the electric circuit through the solenoid 148, energizing the latter and causing it to lower the latch 144 into the path of the upper end of the pawl 140, thereby preventing swing of said pawl toward the left in Figs. 13 and 14, and since the roller 142 will be thus held in a fixed position, continuing rotation of the cam 122 will cause it, through reaction against the roller 142, to swing the type roll shaft 119 toward the right or into the position shown in Fig. 14, the type roll being then in non-printing relation with the impression roll. Upon deenergizing of the solenoid, due to the feed of an envelope blank between the contact members 154 and 155, the latch 144 will be returned to its elevated or non-active position under the action of the spring 150. Means is thus provided for automatically setting the type roll in non-printing relation with the impression roll upon failure of feed of an envelope blank to the printing mechanism.

The inking devices for supplying ink to the printing plate or other printing means on the type roll is carried between the side members 125 and 126 of the shiftable frame and driven from the gear 97 fixed to the type roll. These inking devices comprise a pair of form rollers

160 and 161 which serve to apply ink to the printing plate or the like on the type roll, distributing rollers 162, 163 and 164 for supplying ink to the form rollers, an ink fountain roller 165, and a transfer roller 166 to receive ink from the fountain roller and transfer it to the distributing rollers.

The form roller 160 is mounted on a shaft 167 the ends of which are journalled in bearings 168, and the shaft 167 has a gear 169 which meshes with the gear 97 and by which it is driven. The bearings 168 are removably mounted in the shiftable frame so that the roller 160 may be readily removed therefrom for cleaning or other purposes and replaced with facility. As shown, each of the bearings 168 has a rib 170 thereon which is slidable in a groove 171 formed in the inner side of a bearing block 172, the bearing block being secured to the respective frame member 125 or 126 by a bolt 173 and the bearing block being locked to the respective frame member by a key 174. Each bearing 168 is provided with an elongated slot 175 through which a screw 176 passes, said screw being threaded into the respective bearing block 172 and serving to clamp the respective bearing thereto, and each bearing 168 carries a set screw 177 which is threaded therein and arranged to bear against the outer end of the bearing block 172 and thereby set the bearing 168 in adjusted position so that the periphery of the roller 160 makes proper contact with the printing plate or other printing element on the type roll. A similar mounting is employed for the roller 163 whereby this roller may be removably mounted in the shiftable frame and adjusted and set so that its periphery makes proper contact with the ink distributing rollers 162 and 164. In Fig. 12, the roller 163 is shown by the full lines removed from the bearing blocks and is shown by the dotted lines in operative position on the bearing blocks, and it will be understood that the roller 160 which is mounted in a similar way, may be similarly removed and replaced, the set screws 177 enabling removal and replacement of either or both of these rollers without disturbing the adjustment or adjustments thereof, these set screws serving to determine the adjusted positions of these rollers by engagement with the outer ends of the respective bearing blocks.

The form roller 161 is mounted on a shaft 180 each end of which is journalled in a bearing 181. Each of these bearings has a pin 182 fixed thereon and removably and slidably mounted in a bore 183 formed in a lever 184, and a set screw 185 is threaded through each of the bearings 181 and rests against a shoulder or abutment 186 on the lever 184. By this arrangement, the roller 161 and the bearings 181 may be removed from the levers 184, for cleaning of the roller or other purposes, and when replaced by insertion of the pins 182 in the bores 183, the set screws 185 will insure the return of this roller to its former adjusted position. Each of the levers 184 is pivoted at 187 on the respective side member 125 or 126 of the shiftable frame and may be secured in different adjusted positions about the pivots 187 by swinging the lever, in order to secure proper contact between the roller 161 and the roller 162 and the printing plate or other printing element on the type roll 59 and each of the levers 184 is secured in adjusted position by a clamping bolt 188 which extends through a slot or enlarged opening 189 on the respective side frame member. By mounting the bearings 181 on the levers 184, the respective ends of the roller 161 may be adjusted toward and from the roller 162 and the type roll 59, and by mounting the bearings slidably on the levers 184, the roller 161 may be set more or less in between the roller 162 and the type roll 59. The roller 161 is preferably driven frictionally by contact with the roller 162.

The ink distributing roller 162 is mounted on a shaft 191 which is preferably journalled at its ends in eccentric bushings 192, these bushings being rotatable in the respective side frames 125 and 126 to enable the roller 162 to be adjusted relatively to the rollers 160, 161 and 163, and each bushing is fitted in a split housing having clamping bolts 193 which serve to secure the eccentric bushings in adjusted positions. The roller 162 has a gear 194 fixed to its shaft and meshing with the gear 169 on the shaft of the roller 160, and the gear 194 also meshes with a gear 195 fixed to the shaft 167a of the roller 163 so that these rollers will be driven from the gear 97 through the intermediate gears previously described.

The distributing roller 164 is mounted on a shaft 196 which is journalled in bearings 197 on the frame members 125 and 126 respectively, and this roller has a gear 198 fixed to its shaft and meshing with the gear 195 on the shaft of the roller 163. The shafts 191 and 196 of the rollers 162 and 164 are movable axially in their bearings, and grooved collars 199 and 200 are fixed on the shafts of these rollers and cooperate with rollers or projections 201 and 202 on the respective ends of a lever 203, this lever being pivoted at 204 to the inner side of the frame member 125. The lever and collars just described provide a connection between the rollers 162 and 164 whereby when one of these rollers is moved axially in one direction the other roller is moved axially in the opposite direction. Such axial movement of these rollers is provided for the purpose of insuring uniform distribution of the ink thereon and upon the form rollers 160 and 161, and such axial movement is produced in the present instance by a pinion 205 which is fixed on the shaft 196 of the roller 164 and has flanges 206 which project circumferentially beyond it, this pinion meshing with a gear 207 a portion of which is twisted or distorted out of a plane perpendicular to its axis. The gear 207 is fixed on a shaft 208 which is journalled in a bearing 209 on the lower end of the frame member 126, said shaft having thrust collars 210 and 211 which are pinned or otherwise fixed thereon and abut against the opposite sides of the bearing 209 so that the shaft 208 may revolve in said bearing but will be held against axial movement therein. The toothed portion of the gear 207 meshes with the teeth of the pinion 205 between the flanges 206, and as the gear 207 revolves, the pinion 205 and the shaft 196 to which it is fixed will be shifted axially, due to the axial displacement of portions of the periphery of the gear 207. The ink distributing roller 164 will be thereby shifted axially to distribute ink therefrom onto the roller 163 and, through the rocking of the connecting lever 203, the roller 162 will be simultaneously reciprocated axially to distribute the ink received by it from the roller 163 onto the rollers 160 and 161. The gear 195 fixed on the shaft of the roller 163 is elongated in order that the gears 194 and 198 fixed to the rollers 162 and 164 respectively will remain in mesh therewith during the axial reciprocations of said rollers.

The inking mechanism receives ink from an ink fountain 215 which may be mounted on the tie rod 127. This ink fountain, as shown in detail

in Fig. 26, preferably comprises an ink receptacle 216 one side of which is closed by the roller 165 mounted on a shaft 218, the latter being journalled in suitable bearings 219 at the respective ends of the ink fountain, and the bottom of the ink receptacle is preferably formed of a flexible plate of steel or other suitable material 220 one edge of which may be clamped firmly in place by screws 221 and the other edge of which extends beneath and bears against the underside of the roller 165. In order to insure uniformity of contact of the plate 220 with the periphery of the roller 165 and thereby cause the ink to be distributed uniformly on the surface of the roller 165, a suitable number of levers 222 are pivoted at 223 in the base of the ink fountain, these levers bearing against the underside of the plate 220 at different points along the length of the roller 165 and having individual set screws 223' by means of which they may be adjusted. The roller 165 is rotated to remove ink from the ink fountain preferably by a lever 225 which is pivoted to swing on an extension 226 fixed on the shaft 218, this lever carrying a pawl 227 which cooperates with a ratchet wheel 228 fixed on the shaft 226. The lever 225 is swung to and fro during the operation of the printing mechanism by a link 229 which is pivotally connected to the lever 225 by a pivot 230, this pivot being preferably adjustable in a slot 231 in said lever to vary the throw of said lever and, in consequence, the extent of rotation of the ink fountain roller 165. The link 229 is driven preferably by a crank pin 232 fixed on a side of the gear 207. Ink from the fountain roller 165 is removed therefrom and transferred to the roller 164 by the transfer roller 166 the shaft 234 of which is journalled in the upper ends of a pair of arms 235, these arms being fixed on a shaft 236 journalled in the frame members 125 and 126 and the shaft 236 having a crank arm 237 fixed thereon, this crank arm having a roller 238 thereon which rides on a cam 239 fixed on the shaft 208, a spring 240 holding the roller 238 in contact with said cam. By this arrangement, rotation of the shaft 208 will cause rocking of the crank arm 237 and of the shaft 236 to which it is attached, thereby causing the roller 166 to swing to and fro between the rollers 165 and 164 whereby ink will be removed from the roller 165 by the roller 166 and transferred to the roller 164.

The operation of the improved attachment provided by the present invention is as follows: As each envelope blank A, having its side flaps *b* folded by an envelope machine such as that hereinbefore described or any other suitable machine is presented to the gumming and printing mechanism while being advanced with its unfolded flaps *a* and *c* projecting laterally of its direction of advance as shown in Fig. 6, the flap *c* passes beneath the gum pickers 34 which receive gum or adhesive from the roller 62 and apply it along the lines *c'* to the flap *c*, as shown in Fig. 7, and the previously gummed and dried flap *a* passes between the impression roll 58 and type roll 59. The blank is guided in its travel beneath the gum pickers and between the impression and type rolls by the stationary guide rails 51 and 52 and its advance is assisted by the upper and lower belts 41 and 42 between which it is engaged, as shown in Fig. 13. The printing plate or other printing means 117 is so positioned circumferentially of the type roll 59 as to print the impression at the desired point on the underside of the blank in the direction of the width thereof. In the present instance and as indicated in Fig. 7, the printing plate is adapted to make two printed impressions *d* and *e* on the face of the envelope body, one of these impressions being for example the return address and the other impression a postal frank or the like. The printing plate or other printing means is also positioned at such a distance from the gum pickers as to cause the printed impressions to be made at the desired point or points in the height of the envelope body, according to the size of the envelope. Such location of the printing plate may be obtained to a certain extent by placing the printing plate at one position or another in the direction of the length of the type roll, but such location of the printed impressions is determined primarily by the adjustment of the shiftable frame which carries the impression and type rolls and the inking devices in a direction transversely of the path of travel of the envelope blanks, the screw 132 which adjusts the shiftable frame enabling a fine adjustment to be obtained and moreover, by shifting the frame carrying the impression and type rolls, these elements of the printing mechanism may be adjusted for printing envelopes of different sizes. Furthermore, the impression and type rolls may if desired, be adjusted so that the printed impressions will be produced on the underside of the flap *a*, if such should be desired, or upon any other desired portion of the underside of the envelope blank. Since the inking devices are carried by the same frame which carries the impression and type rolls, the cooperative relation between these elements of the printing mechanism is not disturbed by the adjustments of the shiftable frame.

The pawl 140 and cooperative latch 144 in conjunction with the contact members 154 and 155 between which the envelope blanks pass as they enter the printing mechanism serve to automatically control the printing operation according to the presence or absence of an envelope in printing position. As each envelope blank is about to enter the printing mechanism, it passes between the contact members 154 and 155, thereby separating them so that the electrical circuit of the solenoid 148 is held open, and since the latch 144 will then be held in its inactive lifted position by the spring 150, the pawl 140 will swing idly under the action of the cam 122 and the type roll will occupy printing position. If however an envelope blank fails to feed to the printing mechanism, the contact members 154 and 155 will engage one another, thereby closing the circuit through the solenoid 148 and energizing the same, in consequence of which the latch 144 will be lowered into the path of the pawl 140, and as the high part of the cam 122 engages the roller 142 which is then held stationary, the type roll will be swung rearwardly into non-printing position, thereby avoiding printing on the tympan of the impression roll, which would be objectionable since it would produce a smudge or undesired impression on the next following envelope blank.

Since the envelope blanks are printed at the same time the gum pickers apply gum or adhesive to the bottom flaps thereof, the printing of the envelope blanks is accomplished while the envelopes are being made in the machine, the time and expense that would be involved in printing the envelopes or envelope blanks separately being thereby avoided. By mounting the impression roll on the gum picker shaft and driving the type roll from the impression roll, the printing mechanism is properly timed to op-

erate upon the envelope blanks concurrently with the operation of the gum pickers thereon, thereby insuring proper application of the gum and the printed impressions to the respective portions of the envelope blanks.

I claim as my invention:—

1. In an envelope machine having means for applying a flap securing adhesive to one side of one end of an envelope blank, means operative concurrently with said adhesive applying means but offset therefrom for simultaneously printing on the opposite side and toward the opposite end of the blank, and envelope blank feeding means extending between the adhesive applying means and printing means.

2. In an envelope machine having means for applying an adhesive to an unfolded flap at one end of an envelope blank for securing it in folded position, means connected to and operative simultaneously with said adhesive applying means and offset laterally of the latter for printing on the other side of the blank, and opposed travelling belts extending between said adhesive applying means and printing means for feeding the envelope blanks.

3. In an envelope machine, the combination of a rotatable gum applying device operative to apply gum to one side of an envelope blank during the travel thereof, printing means an element of which is separate from but rotatable coaxially with said gum applying device and operative simultaneously with said gum applying device to print on the other side of the same envelope blank, and means for adjusting said element axially of the gum applying device to print on different portions of the envelope blank relatively to the portion thereof to which the gum is applied by the gum applying device.

4. In an envelope machine, the combination of a rotatable gum applying device operative to apply gum to one portion of an envelope blank during the travel thereof, printing means embodying an impression roll separate from but mounted coaxially with said gum applying device at one side of the latter and a type roll cooperative with said impression roll, and means connecting the printing means to the gum applying device to operate simultaneously with said gum applying device to print on another portion of the envelope blank, said connecting means rendering the printing means adjustable toward and from the gum applying device to print on portions of the envelope blanks at different distances from the portion thereof to which the gum is applied by the gum applying device.

5. In an envelope machine, the combination of a shaft having gum pickers thereon toward one end thereof for applying an adhesive to one portion of an envelope blank, and a printing device comprising an impression roll splined for adjustment axially on said shaft toward its other end in offset relation with said gum pickers and a type roll connected to and cooperative with said impression roll for rotation and adjustment axially therewith, said printing device being operative by said shaft simultaneously with said pickers to print on another portion of the envelope blank beyond the portion thereof to which the gum pickers apply the adhesive.

6. In an envelope machine having means for advancing envelope blanks, and means for applying an adhesive to a portion of each blank during its advance, a printing device embodying printing and impression elements having a driving connection with said gum applying means and operative simultaneously therewith for printing on another portion of each blank, and means supporting the elements of said printing device for adjustment in unison transversely of the path of advance of the blanks independently of said adhesive applying means and while their driving connection therewith is maintained.

7. In an envelope machine, the combination of a shaft carrying gum pickers for applying an adhesive to a portion of the envelope blanks, and a printing device for simultaneously printing on another portion of the blanks, the printing device comprising an impression roll splined on said shaft to move axially thereof, a type roll cooperative with the impression roll and connected to and shiftable axially therewith, inking devices cooperative with the type roll, and means carrying the impression and type rolls and the inking devices as a unit and adjustable relatively to the gum pickers in a direction axially of said shaft.

8. In an envelope machine, the combination of a shaft carrying gum pickers for applying an adhesive to a portion of the envelope blanks, and a printing device for simultaneously printing on another portion of the blanks, the printing device comprising an impression roll splined on said shaft, a type roll cooperative with the impression roll, inking devices cooperative with the type roll, and a frame having means for guiding it for movement in a direction axially of said shaft and carrying the impression and type rolls and the inking devices as a unit.

9. In an envelope machine, the combination of a shaft carrying gum pickers for applying an adhesive to a portion of the envelope blanks, and a printing device for simultaneously printing on another portion of the blanks, the printing device comprising an impression roll splined on said shaft, and having a gear fixed thereto, a frame having a portion in which the impression roll is journalled, said frame having means guiding it for movement axially of said shaft, a type roll journalled in said frame and having a driving gear fixed thereto and cooperating with the gear fixed to the impression roll, and inking devices journalled in said frame and cooperative with the type roll and having driving gears driven from the gear fixed to the type roll.

10. In an envelope machine, the combination of a shaft carrying gum pickers for applying an adhesive to a portion of the envelope blanks, and a printing device for simultaneously printing on another portion of the blanks, the printing device comprising an impression roll splined on said shaft, a type roll having a driving connection with the impression roll, the impression roll being rotatable relatively to said shaft to adjust the type roll to print on different desired areas in the length of the blanks, and means for securing the impression roll in different rotatably adjusted positions on said shaft.

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