

April 8, 1941.

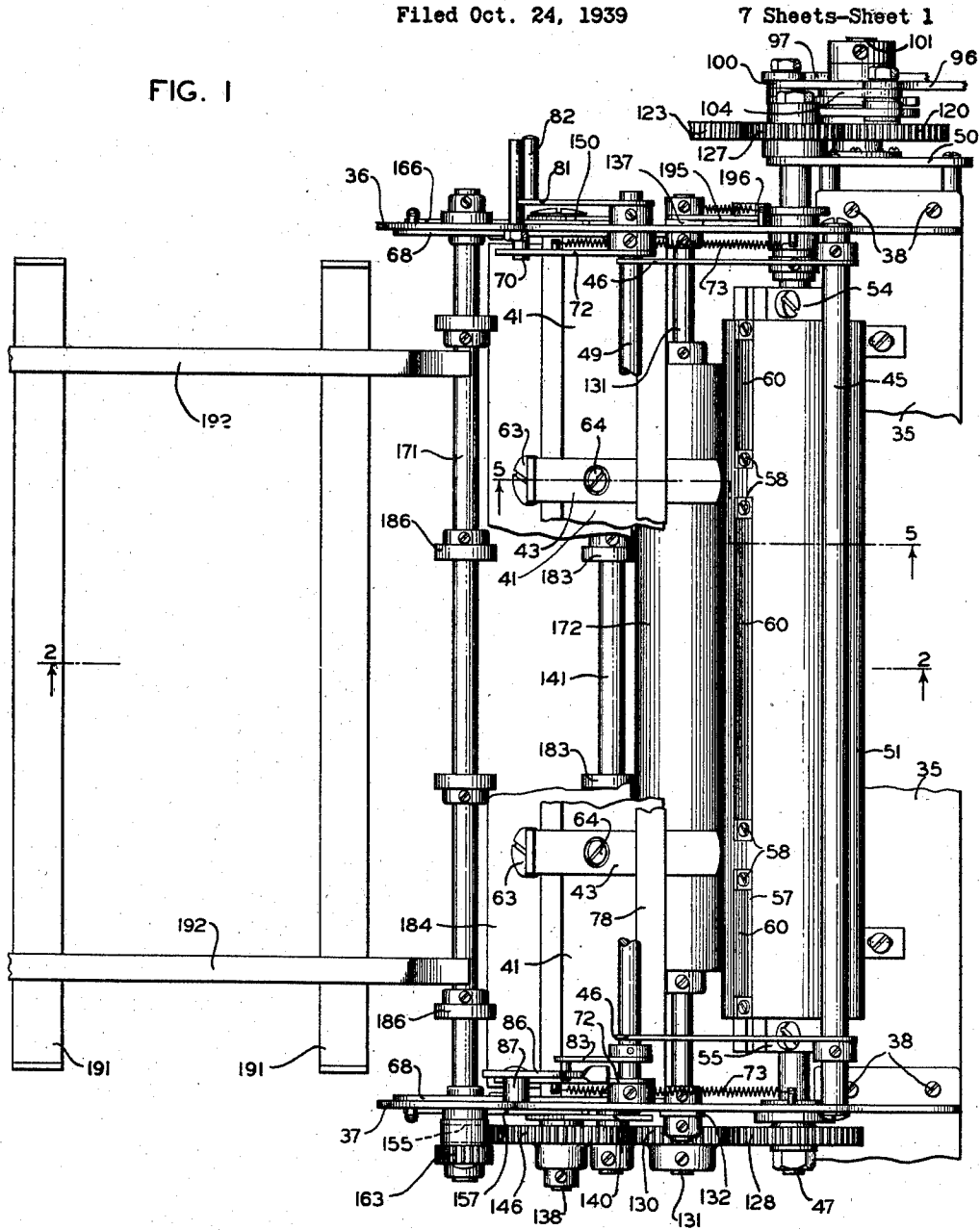
K. J. BRAUN

2,237,874

PAPER FEEDING DEVICE

Filed Oct. 24, 1939

FIG. 1



INVENTOR
KARL J. BRAUN

BY *K. J. Spark*
ATTORNEY

April 8, 1941.

K. J. BRAUN

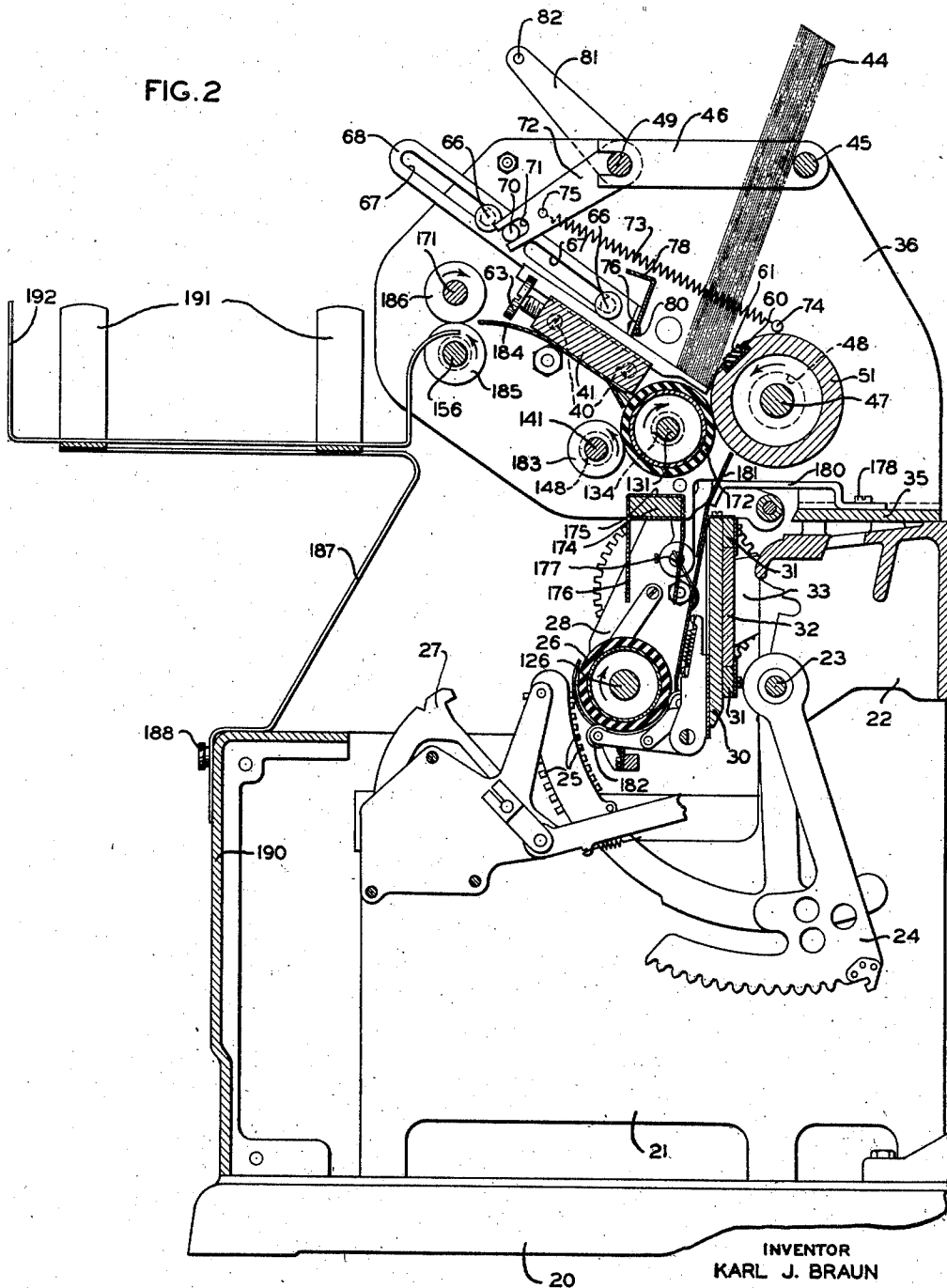
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7 Sheets-Sheet 2

FIG. 2



INVENTOR
KARL J. BRAUN

BY

H. A. Sparks
ATTORNEY

April 8, 1941.

K. J. BRAUN

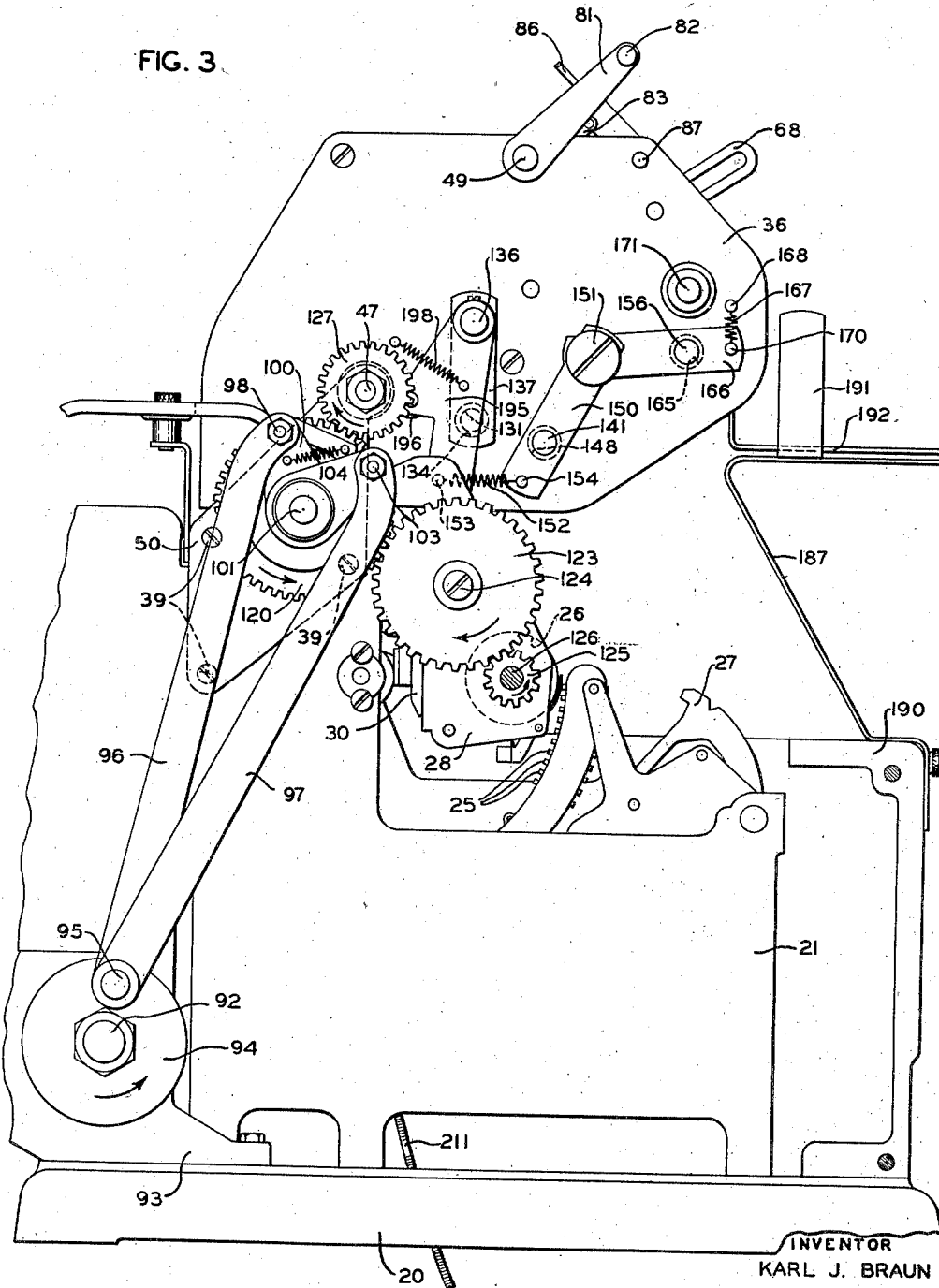
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7 Sheets-Sheet 3

FIG. 3



INVENTOR
KARL J. BRAUN

BY *W. A. Sparks*
ATTORNEY

April 8, 1941.

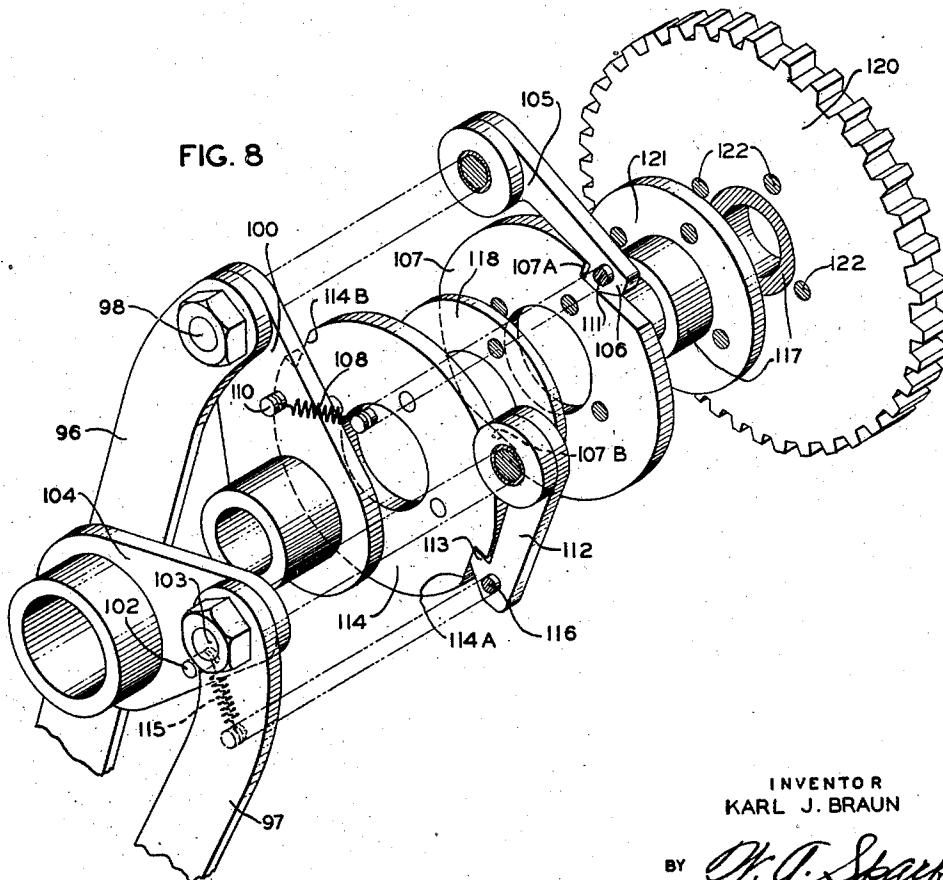
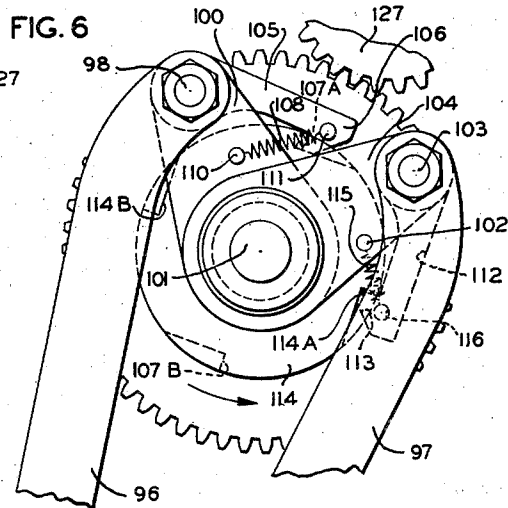
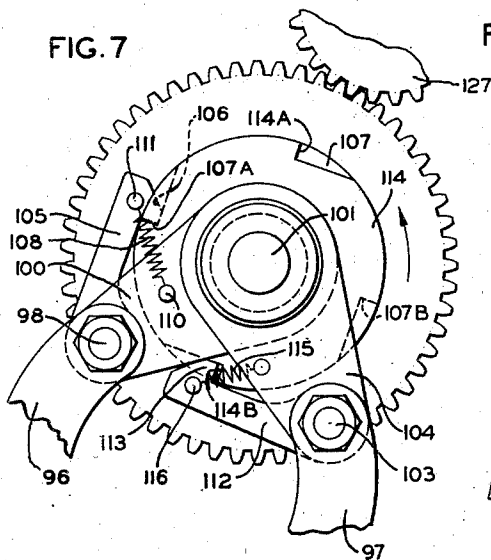
K. J. BRAUN

2,237,874

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7 Sheets-Sheet 5



INVENTOR
KARL J. BRAUN

BY *W. A. Spack*
ATTORNEY

April 8, 1941.

K. J. BRAUN

2,237,874

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7 Sheets-Sheet 6

FIG. 9

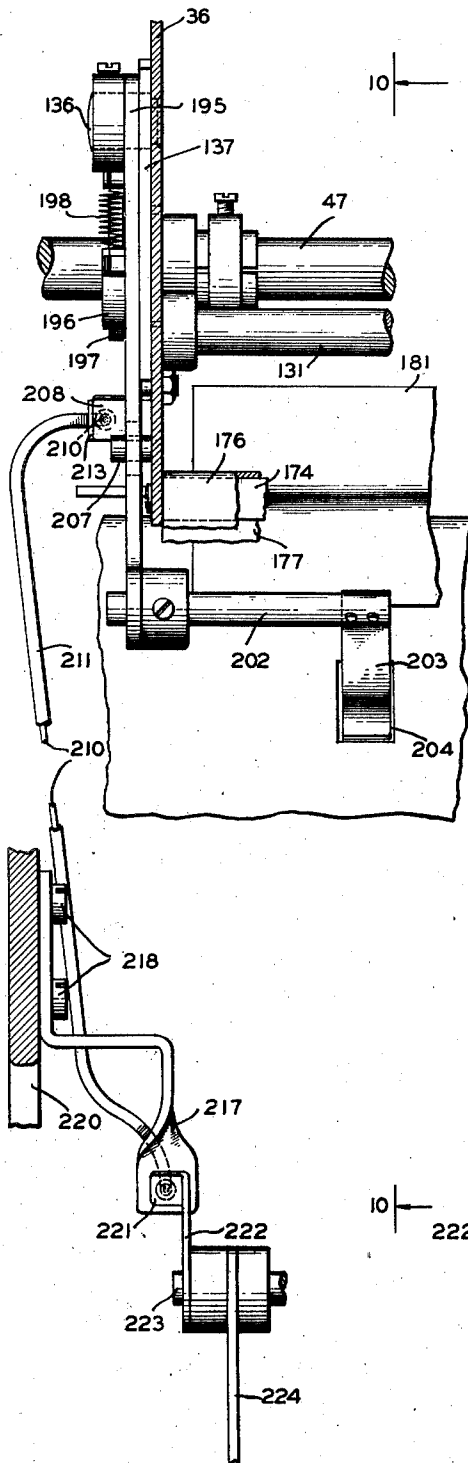
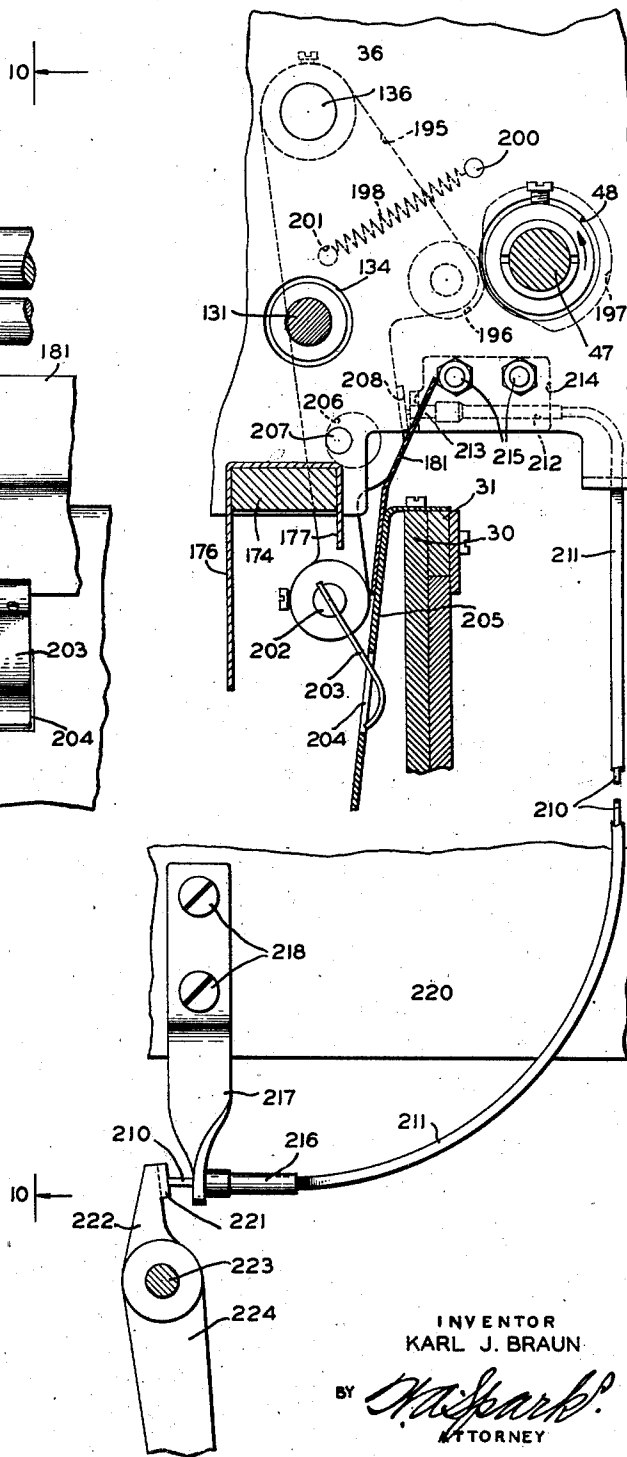


FIG. 10



INVENTOR
KARL J. BRAUN

BY *W. Spark*
ATTORNEY

April 8, 1941.

K. J. BRAUN

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7 Sheets-Sheet 7

FIG. 11

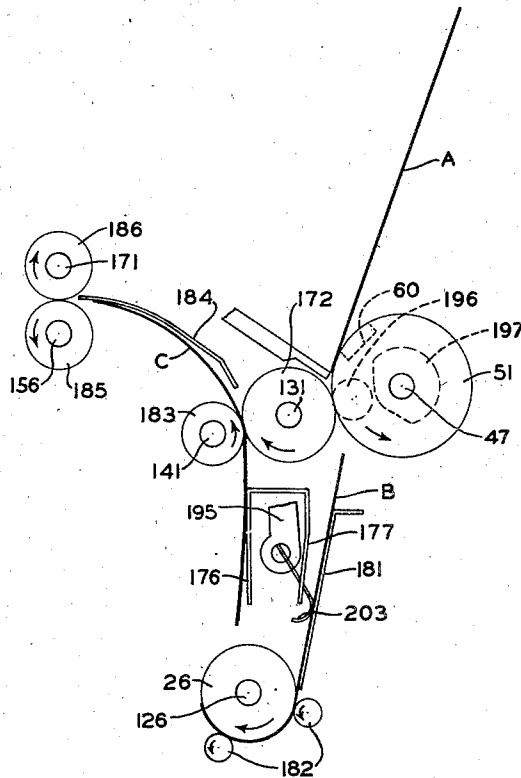
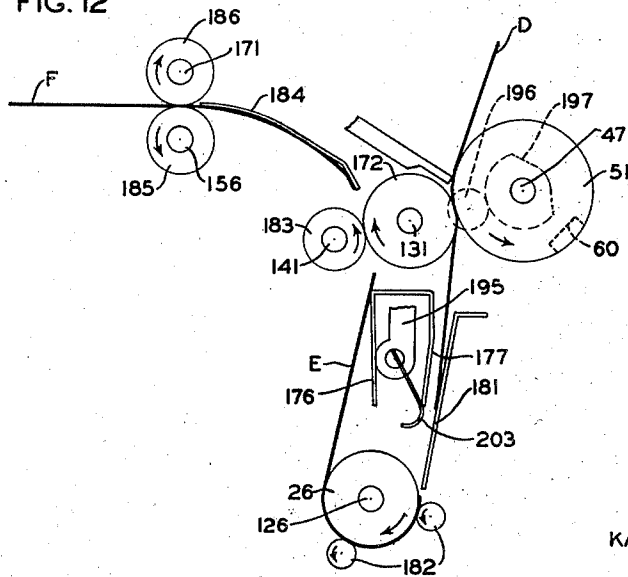


FIG. 12



INVENTOR
KARL J. BRAUN

BY *W. S. Park*
ATTORNEY

UNITED STATES PATENT OFFICE

2,237,874

PAPER FEEDING DEVICE

Karl John Braun, North Merrick, Long Island, N. Y., assignor to Remington Rand Inc., Buffalo, N. Y., a corporation of Delaware

Application October 24, 1939, Serial No. 300,917

10 Claims. (Cl. 271—39)

This invention relates to paper feeding devices, and more particularly to mechanism whereby cards or form sheets may be fed seriatim from a stack in a magazine to a predetermined position wherein the cards or form sheets may be printed.

The present invention is herein shown and described in connection with the well known Powers tabulating machine which has been in commercial use for many years, and which is described in a line of patents beginning with the patent to James Powers, No. 1,245,502, dated November 6, 1917. However, only so much of the above machine will be shown and described herein as will enable one skilled in the art to clearly understand the operation of the present invention. While this invention is herein shown in connection with the above mentioned machine, it will be understood that the invention may be used with other types of machines without departing from the spirit of this invention.

The tabulating machine described in the above mentioned line of patents is generally composed of three sections, the base, the intermediate, and the head section upon which the present invention is mounted.

Generally the base section of the machine contains mechanism for feeding punched cards, having perforations therein, one at a time, into an analyzing mechanism by which the perforations in the card are sensed. Upon sensing a perforation in the card, the analyzing mechanism will cause an interponent in the translator in the intermediate section of the machine to rise, setting up a corresponding stop in the stop basket in the head section of the machine. The stop thus raised limits the forward movement of a corresponding type sector which controls the accounting and printing mechanism of the machine.

The present invention resides in the provision of means for feeding single cards or form sheets, such as that used for tax bills, seriatim, to a printing position around a platen, wherein data that is sensed, from a punched card and accumulated, may be printed upon said cards or form sheets.

The stack of form sheets or blanks, as they will hereinafter be referred to, is placed edgewise upon an adjustable throat, which cooperates with a stripper roll upon which is removably secured a plurality of rubber strips adapted to pick up one blank and feed it between the stripper roll and another roll cooperating therewith. The blank is then fed by the above rolls to a position wherein the data may be printed upon said blank. After the printing operation the blank is ejected by a plurality of eject rolls into a receiving pocket.

It is an object of this invention to insure that only one form sheet or blank of a stack is fed to a printing position during one machine cycle.

It is another object to enable one to simply and conveniently replace worn rubber strips mounted in the stripper roll.

It is another object to interrupt the feeding of a card or form sheet during printing operations.

Other objects and structural details of the invention will be apparent from the following description when read in connection with the accompanying drawings, wherein:

Fig. 1 is a plan view disclosing the present invention mounted on a Powers tabulating machine;

Fig. 2 is a cross sectional elevational view taken substantially along the lines 2—2 of Fig. 1, said view being shown as looking from the right-hand side of the machine;

Fig. 3 is a left-hand elevational view of the machine disclosing the drive mechanism for feeding the blank sheets;

Fig. 4 is a right hand elevational view of the machine showing the drive for the device;

Fig. 5 is an enlarged cross sectional detail view taken substantially along the lines 5—5 of Fig. 1, disclosing the throat adjusting mechanism and the stripper roll;

Fig. 6 is an enlarged detail view of the feed ratchet and associated pawls in normal position;

Fig. 7 is an enlarged detail view of the ratchet and associated pawls shown in Fig. 6, but in a position assumed after the main drive shaft has been rotated 180°;

Fig. 8 is an enlarged exploded isometric view of Fig. 6;

Fig. 9 is a front elevational detail view, partly in section, disclosing the misfeed mechanism;

Fig. 10 is a cross sectional, elevational detail view taken substantially along the lines 10—10 of Fig. 9;

Fig. 11 is a schematic view showing the position of the blank sheets at 0° stopping position of the main shaft of the machine;

Fig. 12 is a schematic view showing the position of the blank sheets at about 180° rotation of the main shaft.

Referring to Figs. 1, 2, and 4, the head section of the machine comprises a base plate 20 (Fig. 2) upon which is secured a pair of upright frame walls 21, between the upper portion of which, and secured thereto, is a cross brace 22. This brace has journaled therein a plurality of shafts 23 upon which are pivotally mounted the well known type sectors 24. The sectors are under control of stops in the well known stop basket

to limit the forward movement thereof and thus control the printing and accounting mechanisms of the machine. The sectors have types 25 mounted thereon which are adapted to be brought into printing relation with a platen 26 and, when in such position, the type is adapted to be struck by a corresponding hammer 27 for the purpose of printing.

The platen 26 is mounted in the well known manner upon a pair of brackets 28, each bracket being secured to one end of a cross plate 30. Upon the rear face of the plate 30 and running parallel therewith is secured a pair of guide rails 31 between which is a slide 32 fixed at its ends to brackets 33, secured to frame walls 21.

As is best seen in Figs. 1 and 2, secured to the upper surface of brace 22 is a cross plate 35, which serves as a base or support for a pair of side plates 36 and 37 fixed upon the plate by screws 38. Secured between the plates 36 and 37 by screws 40 is a rectangular bar 41 having a pair of cutout portions 42 (Fig. 5), adapted to receive an adjustable throat knife 43, the upper surface of which is adapted to support a stack of blanks 44 in edgewise position.

The stack of blanks 44 is supported near its upper portion by a cross bar 45 (Fig. 2) secured between the frame plates 36 and 37. Adjustably secured to the shaft 45 is a pair of forwardly extending arms 46 which serve to guide the stack laterally. The arms 46 are supported at their forward ends by a cross shaft 49, journaled in the plates 36 and 37.

Journaled near its right-hand end in the plate 37 is a shaft 47 (Fig. 4) which extends toward the left, passes through an opening 48 (Fig. 2) in the left hand plate 36, and is journaled near its left hand end in a bracket 50 (Fig. 3) secured to the left hand frame wall 21 by screws 39.

Mounted upon the shaft 47 is a stripper roll 51 (Figs. 1, 2, and 5) having a locating pin 52 secured to the left hand portion thereof which pin is adapted to be received in a notch 53 formed in a clamp 54 adjustably secured to the shaft 47. Fixed to the shaft 47 and located to the right of the stripper roll 51 is another clamp 55 (Fig. 1) which clamp serves to prevent lateral displacement of the stripper roll. As is best seen in Figs. 1 and 5 the roll 51 is formed with three elongated grooves 56 into each of which is removably secured a clamp 57 by means of screws 58. Each clamp 57 has fixed therein a rubber strip 60 its outer or exposed face being corrugated as indicated at 61.

The corrugated portion 61 of the rubber strips 60 is adapted, when the stripper roll 51 is rotated by means which will later be described under the heading of "Drive mechanism," to strip the first blank from the stack 44 and feed said blank in a downward direction (Fig. 5). It will be noted, however, that the stripper roll is adjustably mounted upon the shaft 47 in such a manner that the rubber strip may be positioned to feed the blank at any desired time in a machine cycle. The method of positioning the stripper roll, as above described, is as follows: The clamp 54 is first secured to the shaft 47 so that its notch 53 lies in the desired position. The stripper roll is then mounted upon the shaft 47 in such a way that the pin 52 mounted thereon enters the notch, thereby positioning the roll. The roll is then kept from lateral displacement by the clamp 55. It will thus be seen that, when the worn rubber strip 60 is to be replaced by a new one, it will only be necessary to loosen the

clamp 55 so that the stripper roll may be free of the clamp 54 and thus free access may be had to the rubber strip without changing the setting which is maintained by the clamp 54.

In order to insure that only one blank is fed from the stack by the rubber strip 60, each throat 43 is provided with a notch 62 (Fig. 5) adapted to receive the head portion of an adjustment screw 63, the shank of which is threaded into the forward wall of the bar 41. This construction is such that by turning the screw one way or another a guiding edge 69 of the knife 43 may be brought into proper spaced relation with the periphery of the stripper roll 51 in accordance with the thickness of the blank that is to be fed. Once the proper adjustment between the knife and the roll is made the knife may be secured to the bar 41 by means of set screws 64 which pass through shouldered elongated slots 65 formed in the knife.

In order to insure that the first blank of the stack is not resting upon the upper edge of the throat knife 43 and thereby cause jamming, when said blank is fed, as will hereinafter appear, the following mechanism is provided:

Referring to Figs. 1 and 2, each frame plate 36 and 37 is provided with studs 66 which pass through slots 67 in a slide 68. Each slide has a pin 70 fixed thereto, which cooperate with a fork 71 in an arm 72 secured to the cross shaft 49. The arms 72 are urged in a counter-clockwise direction (Fig. 2) by springs 73, one end of each of which is connected to pins 74 fixed to the plates and the other end connected to pins 75 on the arms. The rear end of the slides 68 is bent to form lugs 76 upon which are secured the ends of a pressure plate 78. The pressure plate has a portion 80 of its lower edge bent slightly rearward so that when the plate is held against the stack of blanks by the action of the springs 73, the portion 80 of the plate will bear against the lower portion of the stack, thereby giving the bottoms of blanks a slight curl thus insuring that the blank which is the next one to be fed does not contact the upper edge of the throat 43.

In order that the pressure plate 78 may be held away from the stack during the insertion or removal of the stack the following latching mechanism is provided. The left-hand end of the shaft 49 extends beyond the frame and has secured thereon an arm 81 provided with a handle 82. Secured near the right-hand end of the shaft 49 is an arm 83 (Fig. 4) having fixed upon its extremity thereof a pin 84 adapted to cooperate with a notch 85 formed in a latch lever 86 which is pivoted upon a stud 87 secured to the right-hand frame 37. The arm 86 has a tail portion 88 formed thereon which is adapted to cooperate with a pin 90 secured to the plate 37, so as to limit the counter-clockwise movement of the lever 86.

Normally the pressure plate 78 and its associated mechanism is in the position shown in Figs. 2 and 4, in which position the card stack may be inserted or removed from its feeding position. When the stack has been inserted or placed upon the throat knife 43, as shown by the dot-and-dash lines in Fig. 2, the lever 86 (Fig. 4) is rocked in a counter-clockwise direction, thereby permitting the arm 83 to rock in a counter-clockwise direction, through the action of springs 74, and thus move the pressure plate against the stack in the position shown in Fig. 5. When it is desired to remove or alter the arrange-

ment of blanks in the stack, the arm 81, through handle 82, is rocked in a clockwise direction (Fig. 2) moving the pressure plate away from the stack until the pin 84 on the arm 83 is engaged by the notch 85 on the latch 86.

Drive mechanism

The operating mechanism in the present invention comprises the well known continuously rotating transverse shaft 92 (Fig. 3) journaled between brackets 93 (one shown) and which makes one revolution for each cycle of the machine. Secured to the left-hand end of the shaft 92 is a circular disc 94 upon which is pivotally mounted, at 95, a pair of upwardly extending links 96 and 97. The upper end of the link 96 is pivotally connected by a stud 98 to an arm 100 which arm is loosely mounted upon a stud shaft 101 fixed to the bracket 93. The upper end of the link 97 is pivotally connected by a stud 103 (Figs. 6, 7, and 8) to an arm 104 pivoted upon the stud shaft 101. Also connected by stud 98 to the link 96 is a pawl 105 having a nose 106 adapted to engage a pair of diametrically opposed notches 107A and 107B formed in a disc 107. The pawl 105 is urged into cooperative relation with the notches in the disc 107 by a spring 108, one end of which is connected to a pin 110 on the arm 100 and the other end connected to a pin 111 on the pawl 105. Connected by stud 103 to the link 97 is a pawl 112 having a nose 113 adapted to engage a pair of diametrically opposed notches 114A and 114B formed in a disc 114. The pawl 112 is urged into cooperative relation with the notches in the disc 114 by a spring 115, one end of which is connected to a pin 102 on the arm 104 and the other end to a pin 116 on the pawl 112.

As is best seen in Fig. 8, the discs 107 and 114 are mounted upon the left-hand portion of a hub 117, said discs being spaced apart by a spacer 118. Upon the flange 121 of the hub 117 is secured a gear 120. Rivets 122 are provided to secure the discs 107 and 114, the spacer 118, and the gear 120 to the flange 121 of hub 117 to form a unitary assembly which is rotatably mounted upon the shaft 101. The discs 107 and 114 are secured together, as described above, with the notches thereof positioned in the following manner. Beginning with notch 107A (Fig. 6) and moving in a clockwise direction, the notches 107A, 114A, 107B, and 114B are spaced 90° apart.

Referring to Figs. 3, 6, and 7, the above construction is such that, when the drive shaft 92 starts to rotate from normal position, the disc 94 moves the links 96 and 97 downwardly. The movement of the link 96 will cause its upper pivot 98 through arm 100 to move in an arcuate path about the shaft 101, in a counter-clockwise direction, thereby moving the pawl 105, until the nose 106 thereon engages the shoulder of the notch 107A in the disc 107. Further downward movement of the link 96 will cause the pawl 105 to rotate the discs 107 and 114 until the shaft 92 has rotated about 170° at which time the pivot 95 is at its bottom dead center relative to the pivot 98 and shaft 92. By this movement the discs 107 and 114 have been rotated about 90°. Continued rotation of the shaft 92 (from 170° to 180° at which time printing occurs) raises the pivot 98 to the position shown in Fig. 7, without effecting any rotation of shaft 101. This period insures that the platen will be stationary during printing.

The simultaneous downward movement of the

link 97 causes the upper pivot 103 through the arm 104 to move in an arcuate path about the shaft 101 in a clockwise direction, thereby moving its associated pawl 112 about the periphery of the disc 114 until the shaft 92 has rotated about 165° at which time the pivot has reached its bottom dead center relative to the shaft 92 and pivot 103. It will be seen that the travel of the pawl 112 is of such an extent that the nose 113 thereof enters the notch 114B of disc 114 and continues in a clockwise direction until but a slight clearance between it and the shoulder of the notch 114B is reached. Further rotation of the shaft 92 (from 165° to 180°, at which time the printing occurs) rotates the pivot 103 in a counter-clockwise direction to the position shown in Fig. 7 diminishing the clearance between the nose 113 and the shoulder of the notch 114B. Continued rotation of the shaft 92 (from 180°) brings the pawl 112 into contact with the shoulder of the notch 114B, at about 185°, from which point the discs 107 and 114 are rotated another 90° back to normal position as shown in Fig. 6. The total amount of rotation of the gear 120 is, therefore, 180° for each complete revolution of the shaft 92.

Shortly before the completion of the last half cycle of shaft 92 (about 345°) the pivot 95 reaches its top dead center relative to the shaft 92 and the pivot 103, at which time the rotation of the discs 114 and 107 is interrupted. Further rotation of the shaft 92 (from 345° to 360°) moves the nose of the pawl 112 clockwise from the shoulder of the notch 114A to the position shown in Fig. 6.

The simultaneous clockwise movement of the pivot 98 moves the nose of the pawl 105 about the periphery of the disc 107 until the shaft 92 has been rotated about 355° at which time the pivot 95 has reached its top dead center relative to the pivot 98 and shaft 92. This movement of the pivot 98 moves the nose of the pawl 105 into the notch 107A but slightly spaced away therefrom. Further rotation of the shaft 92 (from 355° to 360°) moves the pivot 98 counter-clockwise and consequently diminishes the clearance between the nose 106 of pawl 105 and the shoulder of the notch 107A to the position shown in Fig. 6.

The platen 26 is driven in a counter-clockwise direction (Fig. 3) by means of an idler gear 123 mounted for rotation upon a stud 124 fixed to the bracket 28, the gear 123 being in constant meshing engagement with the gear 120 and a gear 125 fixed to a shaft 126 on which the platen is mounted.

The gear 120 meshes with another gear 127 which is fixed to the transverse shaft 47 journaled near its left-hand end on the upper portion of the bracket 50. The shaft 47 passes through the opening 48 in the left-hand frame plate 36 and is journaled near its right-hand end in the right-hand frame plate 37, as above described. Secured to the right-hand end of the shaft 47 is a gear 128 (Fig. 4) which meshes with a gear 130 fixed to the right-hand end of a cross shaft 131. The shaft 131 is supported near its right-hand end by a depending arm 132 rotatably mounted upon a stud 133, which is secured to the right-hand frame plate 37. The plates 36 and 37 are provided with respective circular openings 134 and 135 through which the shaft 131 passes, and in which it is free to move in an arc. Secured to the left-hand frame plate 36 (Fig. 3) is a stud 136 upon which

is rotatably mounted a depending arm 137, the lower end of which is adapted to support the left-hand end of the shaft 131.

Pivoted upon a stud 138 (Fig. 4) secured to the right-hand plate 37, is a depending arm 140, the lower portion of which is adapted to support a shaft 141 having secured thereon a gear 142. The gear 142 is urged into cooperative relation with the gear 130 by a spring 143, one end of which is connected to a pin 144 fixed to the plate 37, and the other end of which is connected to a pin 145 fixed to the arm 140. Also rotatably mounted upon the stud 138 is an idler gear 146, which is constantly in mesh with the gear 142. The shaft 141 extends toward the left of the machine, passes through the respective openings 147 and 148 of frames 37 and 36, and is journaled at its left-hand end in a depending arm 150 pivoted upon a stud 151 fixed to the frame plate 36. The arm 150 is urged in a clockwise direction (Fig. 3) by a spring 152 having one end connected to a pin 153 fixed to the left-hand plate 36 and the other end connected to a pin 154 fixed to the arm 150. Meshing with the idler gear 146 (Fig. 4) is another gear 155 secured to a shaft 156 journaled in a forwardly extending arm 157 also pivotally mounted upon the stud 138. Formed integral with the gear 155 is a larger gear 158. The arm 157 is urged in a clockwise direction (Fig. 4) by a spring 160 having one end connected to a pin 161 fixed to the frame plate 37 and the other end connected to a pin 162 fixed to the arm 157 so that the gear 158 is held in mesh with another gear 163. The shaft 156 extends toward the left of the machine and passes through respective circular openings 164 and 165 in plates 37 and 36 and is journaled at its left-hand end in a forwardly extending arm 166 pivotally mounted upon the stud 151. The arm 166 is urged in a counter-clockwise direction (Fig. 3) by a spring 167 having one end connected to a pin 168 fixed to the plate 36 and the other end connected to a pin 170 fixed to the arm 166.

The gear 163 is fixed to the right-hand end of a shaft 171 journaled in the plates 36 and 37.

It will be seen from the above that the gears 128, 142 and 158 (Fig. 4) rotate in a counter-clockwise direction, while the gears 130, 146, and 163 rotate in a clockwise direction.

Form feeding

Referring to Fig. 11 a blank is shown schematically, in three different positions, A, B, and C. In the A position the blank is shown in the position assumed before it is stripped from the stack by the stripper roll 51. In the B position the blank is shown in the position it assumes after the machine has completed one complete cycle. In the C position the blank is shown in the position assumed after the machine has completed a succeeding cycle.

Referring now to Fig. 12 the blank is shown in three different positions D, E, and F. In the D position the blank is shown in the position it assumes when the main shaft 92 has rotated about 170°. In the E position the blank is shown in the position it assumes when the shaft 92 has rotated an added complete cycle from the D position. In the F position the blank is shown in the position it assumes when the shaft 92 has rotated an added cycle from the E position. The blanks assume the above positions A, B, C, D, E, and F in the following manner.

As was previously described, shortly after the

beginning of the counter-clockwise rotation of the shaft 92 (at about 20°), the shaft 47 (Fig. 3) starts to rotate in a clockwise direction. This will rotate the stripper roll 51 in a counter-clockwise direction (Figs. 2, 11, and 12) so that the corrugated portion 61 of the rubber strip 60 (Fig. 5) contacts the lower face of the first blank of the stack and moves said blank in a downward direction. This downward movement is continued until the lower portion of the blank is gripped between the stripper roll 51 and a pressure feed roll 172 secured to the shaft 131. The rolls 51 and 172 continue feeding the blank downwardly until the shaft 92 has rotated about 170°, at which time the rolls 51 and 172 are idle as hereinbefore described. The blank just being fed is now in the position D shown schematically in Fig. 12. Secured to and between the frame plates 36 and 37 by screws 173 (Fig. 4) is a cross bar 174 (Fig. 2) to which is secured a U-shaped deflector 175 having a front and rear wall 176 and 177, respectively. Adjustably secured to the cross plate 35 at 178 is a deflector bracket 180 having secured at the front portion thereof a deflector 181.

Shortly after the shaft 92 has continued its rotation from 180° (at about 185°) the rolls 51 and 172 start to feed the blank downwardly from the D position (Fig. 12), said blank being guided in such movement by the deflectors 177 and 181. Continued rotation of the shaft 92 causes the rolls 51 and 172 to feed the blank to a position wherein the blank is picked up by the platen 26 and the usual platen feed pressure rolls 182 and fed by them to the B position (Fig. 11). Soon after the start of a succeeding cycle of the shaft 92 the blank is fed by the platen 26 and rolls 182 until just prior to 180° (about 170°) rotation of the shaft 92, at which time the blank is fed to the E position, where it is held momentarily due to the lost motion between the pawls 105 and 112 and notches in discs 107 and 114. During this momentary halt in the feeding a printing operation is effected. Continued rotation of the shaft 92 from its 180° position will cause the blank to be further fed into a position, whereby it is gripped by the roll 172 and a plurality of eject rolls 183 secured to the shaft 141, the blank being deflected into such gripping position by the deflector 176. The blank at the end of this second cycle of the machine is in the position C (Fig. 11).

Secured to the underside of the rectangular bar 41 (Fig. 2) is another deflector plate 184 which serves to deflect the outgoing blank so that the edge thereof will be gripped between a plurality of pressure rolls 185, fixed to the shaft 156 and a plurality of stationary rolls 186 fixed to the shaft 171. The blank is in the F (Fig. 12) position when the shaft 92 has rotated about 180° of the third cycle. The rolls 185 and 186 eject the blank upon a receiver consisting of a pair of brackets 187 (Fig. 2) secured by screws 188 to a front frame wall 190 fixed to the base plate 20 of the head of the machine. The brackets 187 have secured thereon a pair of U-shaped strips 191 running transversely of the machine and another pair of U-shaped strips 192 running at right angles to the strips 191.

Misfeed mechanism

The throat knife is adjustable so as to position the rear edge 69 thereof in a minimum spaced relation with the periphery of the stripper roll 51 to insure that only one blank may be

fed at one time. It will be seen, therefore, that should the lower edge of the blank be of irregular line, portions thereof will rest upon the upper surface of the throat 43, and, when the rubber strip 60 of the roll 51 tends to feed the blank, jamming would occur, causing damage to the machine. Also continued rotation of the roll will cause damage to other blanks as the rubber strip engages the stack once for each cycle of the machine.

Moreover, if the number of punched cards to be sensed is more than the number of blanks in the stack, it will be seen that if no means were provided for stopping the machine, the remaining number of punched cards will be sensed and the data sensed therein will not be printed in a blank which will result in disarranging the punched cards.

Accordingly, the following mechanism is provided to stop the machine from operating when a card is jammed at the throat, or after the last blank has been fed from the printing line.

Pivoted upon the stud 136 (Figs. 3, 9, and 10) and adjacent the arm 137 is a depending arm 195 (Figs. 9 and 10) upon which is rotatably mounted a follower roll 196 adapted to cooperate with a cam 197 secured to the shaft 47. The arm 195 is urged in a counterclockwise direction (Fig. 10) by a spring 198 having one end thereof connected to a pin 200 secured to the plate 36 and the other end connected to a pin 201 fixed to the arm 195. Fixed to the lower portion of the arm 195 is one end of a stub shaft 202, the other end of said shaft having secured thereto a depending blade 203, the lower portion of which is adapted to enter a rectangular opening 204 formed in a guide plate 205 fixed to the cross plate 30. The arm 195 is provided with a circular opening 206 through which passes a pin 207 secured to the plate 36 for limiting the rocking movement of said arm. A lug 208 formed integral with the arm 195 and bent leftwardly (Fig. 9) cooperates with one end of an interponent 210 enclosed within a Bowden wire casing 211 having one end secured to a fitting 212 fixed to a lug 213 of a bracket 214, which bracket is secured to the plate 36 at 215. The other end of the casing 211 terminates in a fitting 216 secured to the lower end of a bracket 217 which bracket is fixed at 218 to the left-hand intermediate frame 220. The frame 220 is the same as that shown in Fig. 1 of, and described in, the U. S. Patent 2,044,119 to W. W. Lasker, issued June 16, 1936 and is designated therein by the numeral 13. The other end of the interponent 210 cooperates with a lug 221 on an upstanding arm 222, pivoted at 223. The arm 222 is formed integral with a rocking arm 224, which arm is also shown in Fig. 18 of the above mentioned patent and designated therein by the numeral 68. Referring to Fig. 17 of the above mentioned patent, it will be seen that, when the arm 68 is rocked in a clockwise direction, the interponent 66 carried thereby will be interposed between the upper end of the link 57 and the lever 61 so that toward the end of a tabulating cycle the clutch will become disengaged, thereby stopping the machine.

Referring now to Fig. 10 of the present drawings, it will be noted that this view is looking from the inside of the machine. Accordingly, in order to stop the machine, in the present invention, as viewed in Fig. 10, the arm 224 (68 of the above mentioned patent) is rocked in a counter-clockwise direction against the tension of

a spring (not shown). Referring again to Fig. 10, the parts shown therein are positioned as they would appear after the last blank has been ejected or just before feeding the first blank of a stack.

Assume now that a stack of blanks is in position to be fed to the printing line one at a time. Shortly after the main shaft 92 starts to rotate the rubber strip 60 begins to feed one blank between the rolls 51 and 172, as hereinbefore described. Shortly thereafter, but before the lower edge of the blank has contacted the blade 203 the high portion of the cam 197 engages the roller 196 on the arm 195 and rocks said arm and roller in a clockwise direction (Fig. 10), thus moving the blade 203 out of engagement with the opening 204 and consequently out of the path of the blank.

Further movement of the main shaft 92 causes the blank to be moved downwardly until just before the shaft 92 has rotated 180°, at about which time printing occurs. It will be noted that this printing operation is an idle one as the first blank has not been fed to the printing line. At this time the blade is still out of the path of the blank as is best seen in Fig. 12. The rotation of the shaft 101 being resumed, the blank is moved to a position shown in Fig. 11 and designated B, wherein the lower portion of the card has been fed between the rolls 182 and the platen 26, this occurring near the end of the first cycle of the shaft 92. Just prior to this, at about 270°, the roller 196 began to ride on the low portion of the cam 197, thereby moving the blade 203 into contact with the blank being fed as seen in Fig. 11. It will be seen that, while the blade 203 contacts the blank, the lug 208 on the arm 195 does not move the interponent 215 to cause the machine to stop. During the following cycle (second) of the machine, the first blank is brought to printing position at about 170° rotation of the shaft 92 and at the same time another blank is fed by the rolls 51 and 172. Further rotation of the shaft 92 will cause the first blank to be fed into the eject rolls 185 and 186 and the second blank to be sensed by the blade 203. Accordingly, as long as the blade 203 senses the presence of a blank the machine will operate as described. However, shortly after the last blank of a stack has been printed, the blade upon sensing the absence of a blank card enters the openings 204, causing the lug on the arm 208 to engage the interponent 210 and rock the arms 222 and 224 in a counter-clockwise direction (Fig. 10), thereby conditioning the machine to stop at the end of the cycle. Obviously, should the blank be jammed and not fed to position B, as described above, the machine would be conditioned to stop at the end of the cycle in which jamming occurred.

While I have described what I consider to be a highly desirable embodiment of my invention, it is obvious that many changes in form could be made without departing from the spirit of my invention, and I, therefore, do not limit myself to the exact form herein shown and described, nor to anything less than the whole of my invention as hereinbefore set forth, and as hereinafter claimed.

What I claim as new, and desire to secure by Letters Patent, is:

1. In a machine of the class described, the combination of means for feeding single forms from a stack, said means including a stripper roll having a plurality of removable rubber strips

mounted thereon, said strips having a corrugated exterior adapted to contact a portion of one of said forms, a shaft, upon which said stripper roll is mounted, a driving element adjustably secured to said shaft, and a coupling device for connecting said stripper roll with said driving element whereby the rubber strips are properly positioned relative to said form.

2. In a machine of the class described, means including a stripper roll for feeding single forms from a stack, a plurality of resilient strips mounted upon said stripper roll for stripping forms seriatim from said stack, a shaft, and means for adjustably mounting said stripper roll on said shaft for positioning said resilient strips relative to said form, said last mentioned means including a clamp adjustably mounted upon said shaft and having a notch formed therein adapted to receive a pin mounted upon said stripper roll.

3. In a machine of the class described, the combination of a stripper roll for stripping single forms from a stack, means for supporting said stack edgewise, said supporting means being spaced away from the periphery of said stripper roll to form a recess between said supporting means and said stripper roll, resilient means when effective for holding said stack against the periphery of said stripper roll, means formed on said resilient means for offsetting the lower portion of said stack so as to position the lower edge of the foremost form in said stack in register with said recess, and means for latching said resilient means to ineffective position for permitting insertion and removal of said stack from said supporting means.

4. In a machine of the class described, the combination of a stripper roll for stripping single forms from a stack, adjustable means for supporting said stack edgewise, said adjustable means being in close proximity to said stripper roll, resilient means including a plate for holding said stack against the periphery of said stripper roll, means formed on said plate for positioning the lower portion of the foremost form of said stack in register with the space between said adjustable means and said stripper roll, and manually operable means for holding said resilient means away from said stack.

5. In a machine of the class described, the combination of a stripper roll for stripping single forms from a stack, a main operating shaft, means operable by said main shaft for rotating said stripper roll 180° during less than 180° rotation of said main shaft, and additional means operable by said main shaft for rotating said stripper roll another 180° during less than 180° additional rotation of said main shaft.

6. In a machine of the class described, the combination of a main operating mechanism, a stripper roll adapted to strip single forms from a stack, means for feeding a stripped form to a printing position, and a device operable by said main operating mechanism for operating said stripper roll and said feeding means, said device being so constructed that the operation of the stripper roll and the feeding means is interrupted while said stripped form is in said printing position and resumed after printing on said form is accomplished.

7. In a machine of the class described, the combination of a stripper roll for stripping single forms from a stack; a main operating mechanism; a pair of links operable by said main oper-

ating mechanism; a shaft; means, including a pair of notched discs mounted upon said shaft, through which said stripper roll is operated; an arm for each of the links also mounted upon said shaft; and a pawl connected to each link and arm and operable thereby, said pawls being adapted to cooperate with the notches on said discs in such a manner as to cause the same to be rotated 90° during less than 180° rotation of said main operating mechanism, and an additional 90° during less than an additional 180° rotation of said main operating mechanism.

8. In a machine of the class described, the combination with a printing mechanism; of a stripper roll for stripping single forms from a stack; a main operating mechanism; means operable by said main operating mechanism for rotating said stripper roll 180° during less than 180° rotation of said main operating mechanism; additional means operable by said main operating mechanism for rotating said stripper roll another 180° during less than 180° rotation of said main operating mechanism; and means operable by said first mentioned means for feeding said stripped form to printing position, said first and second mentioned means being so constructed that after said stripper roll has completed its first 180° rotation the main operating mechanism moves a certain distance before rotating said stripper roll the additional 180° thus interrupting the operation of said stripper roll and said feeding means for a certain period during which printing occurs.

9. In a machine of the class described, the combination of a stripper roll for stripping single forms from a stack; a main operating mechanism; a shaft; a gear, mounted upon said shaft, through which the stripper roll is operated; a device including a link connected to said main operating mechanism, an arm mounted upon said shaft and connected to said link, a pawl connected to said arm and said link and operable thereby, a disc mounted upon said shaft fixed to said gear, and notches in said disc cooperable with said pawl to cause said disc and said gear to be rotated 90° during less than 180° rotation of said main operating mechanism; and an additional device including a link connected to said main operating mechanism, an arm mounted upon said shaft and connected to said link, a pawl connected to said link and arm and operable thereby, a disc mounted upon said shaft and fixed to said gear, and notches in said disc cooperable with said pawl to cause said disc and said gear to be rotated an additional 90° during less than 180° additional rotation of said main operating mechanism.

10. In a machine of the class described, the combination of a stripper roll for stripping single forms from a stack, a main operating mechanism, means operable by said main operating mechanism for rotating said stripper roll 180° during less than 180° rotation of said main operating mechanism, additional means operable by said main operating mechanism for rotating said stripper roll another 180° during less than 180° of said main operating mechanism, said first and second mentioned means being so constructed that the main operating mechanism moves a certain distance before commencing to rotate the stripper roll the first 180° and before commencing to rotate same the additional 180°.

KARL JOHN BRAUN.