June 2, 1953 B. E. NELSON 2,640,695

CARD OVERLAP AND ADHERING MACHINE

Filed June 14, 1948 7 Sheets-Sheet 1

FIG. 1

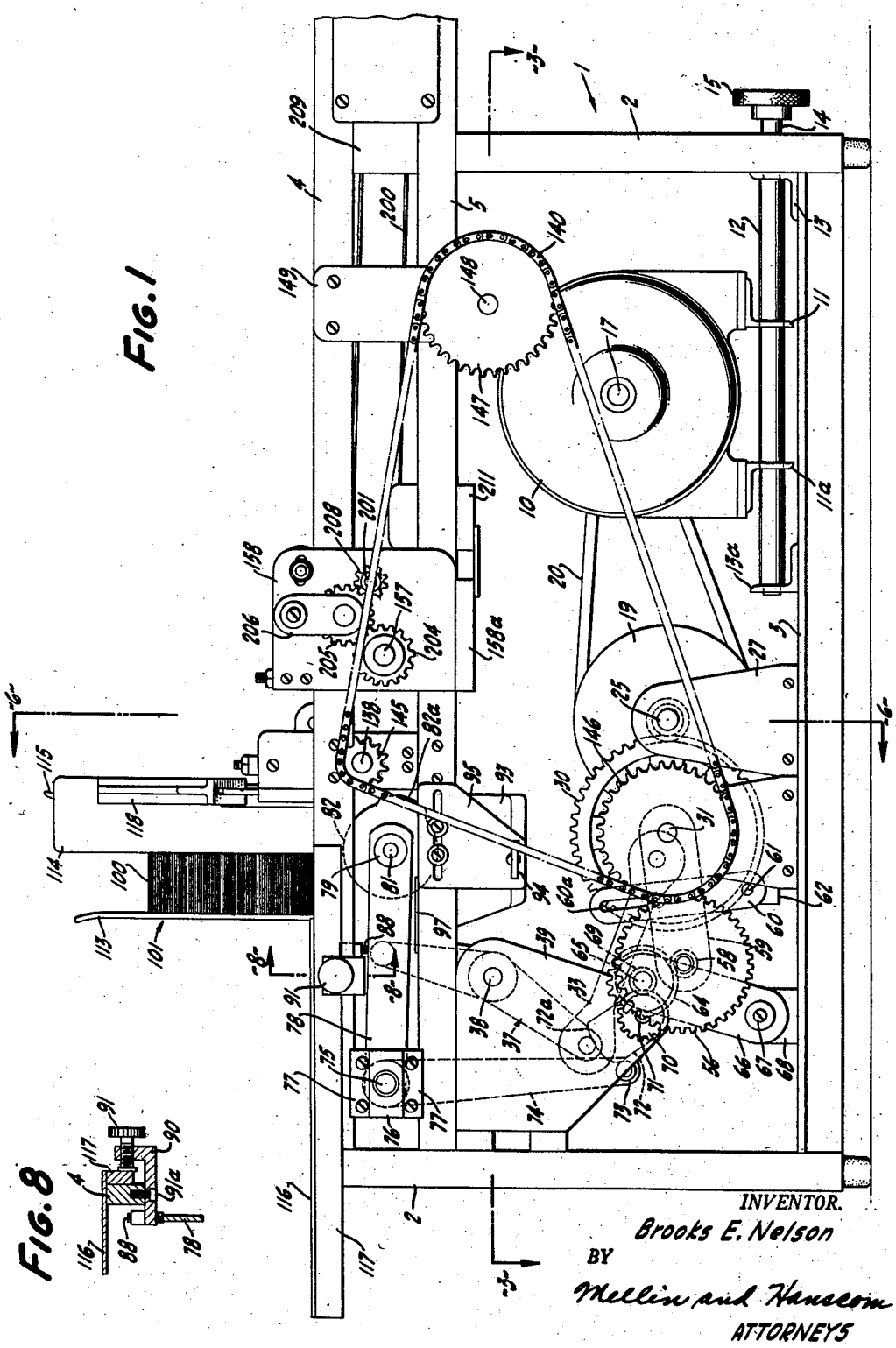


FIG. 8

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CARD OVERLAP AND ADHERING MACHINE

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FIG. 2

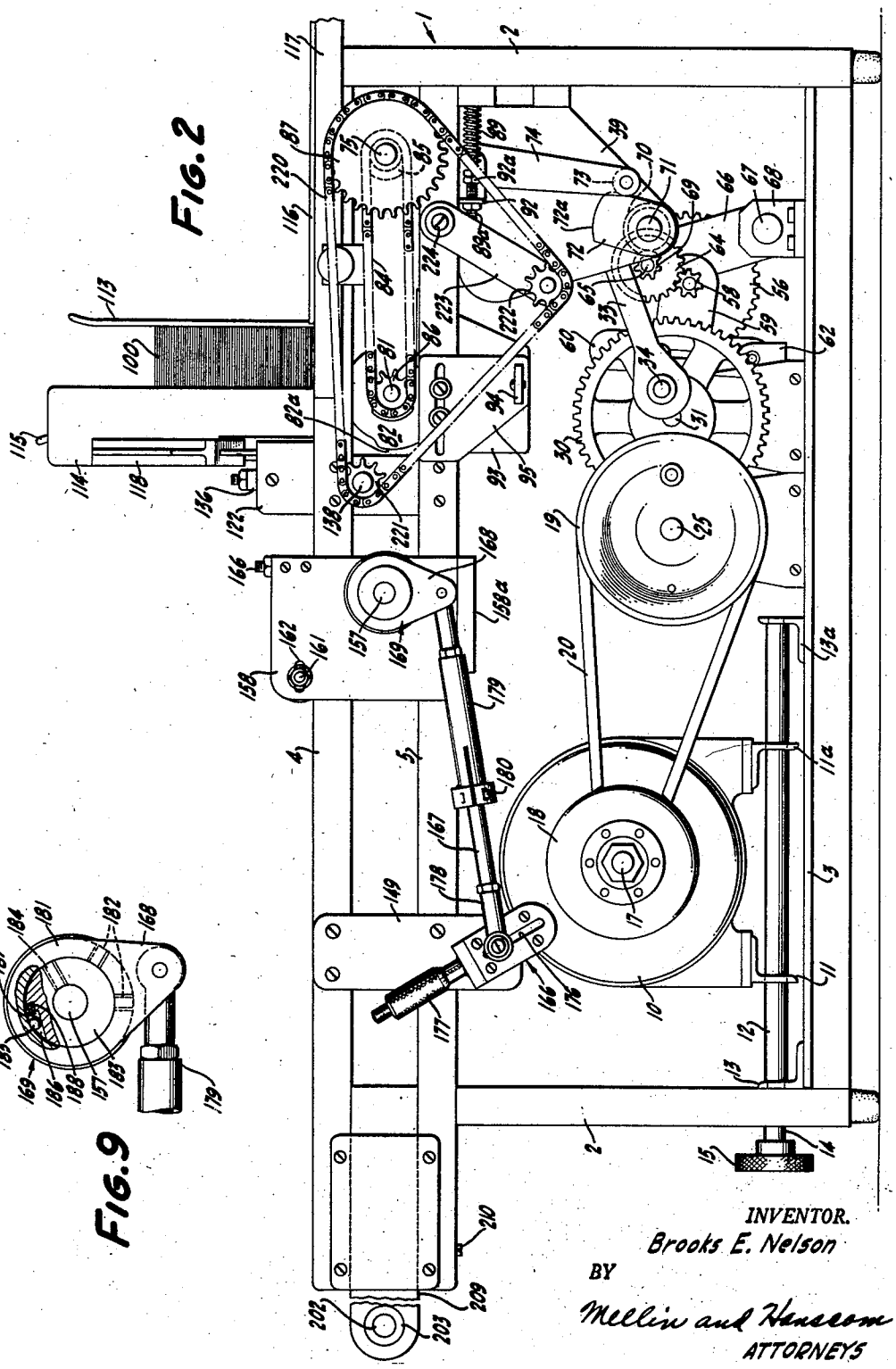


FIG. 9

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CARD OVERLAP AND ADHERING MACHINE

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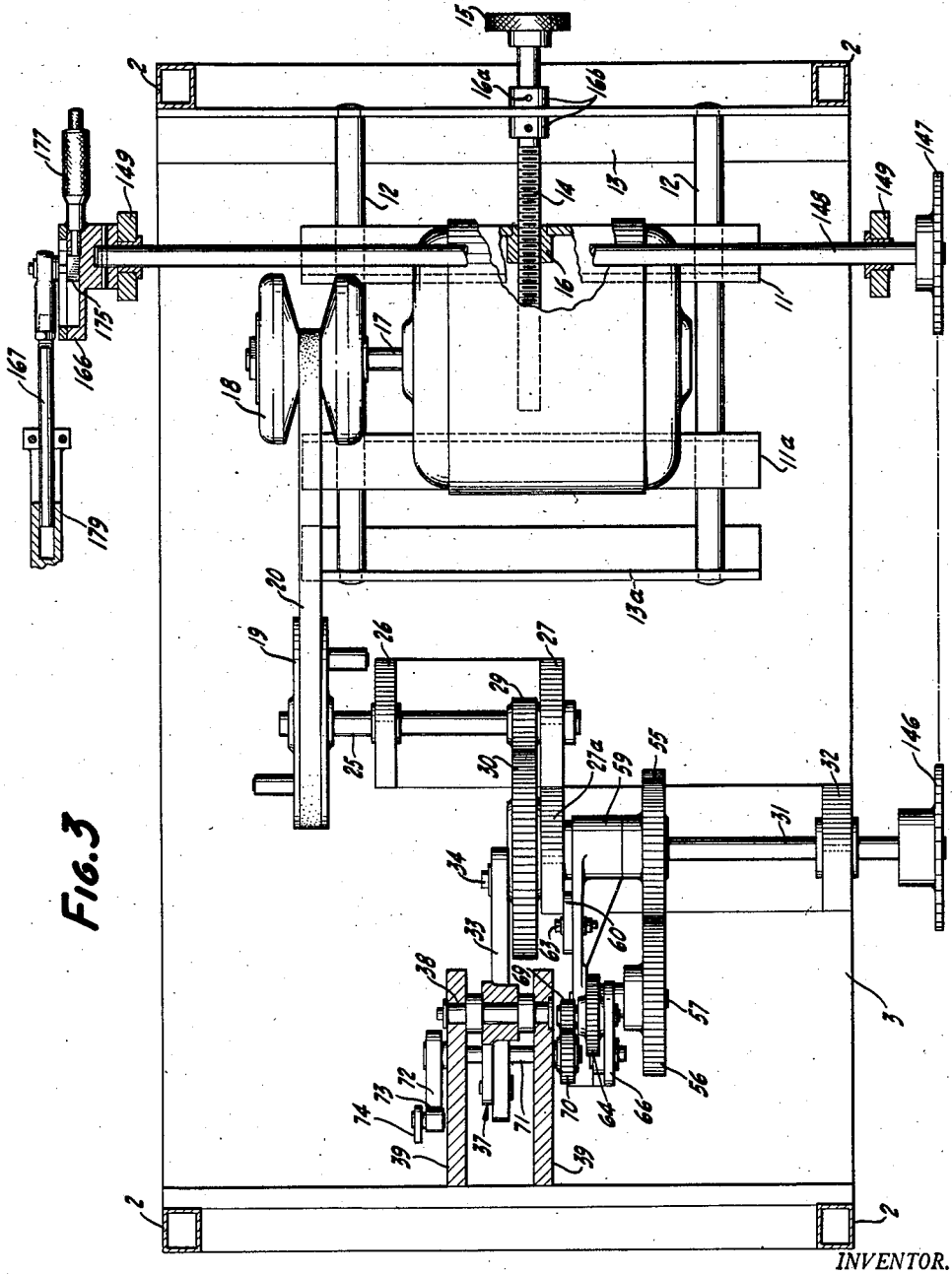


FIG. 3

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CARD OVERLAP AND ADHERING MACHINE

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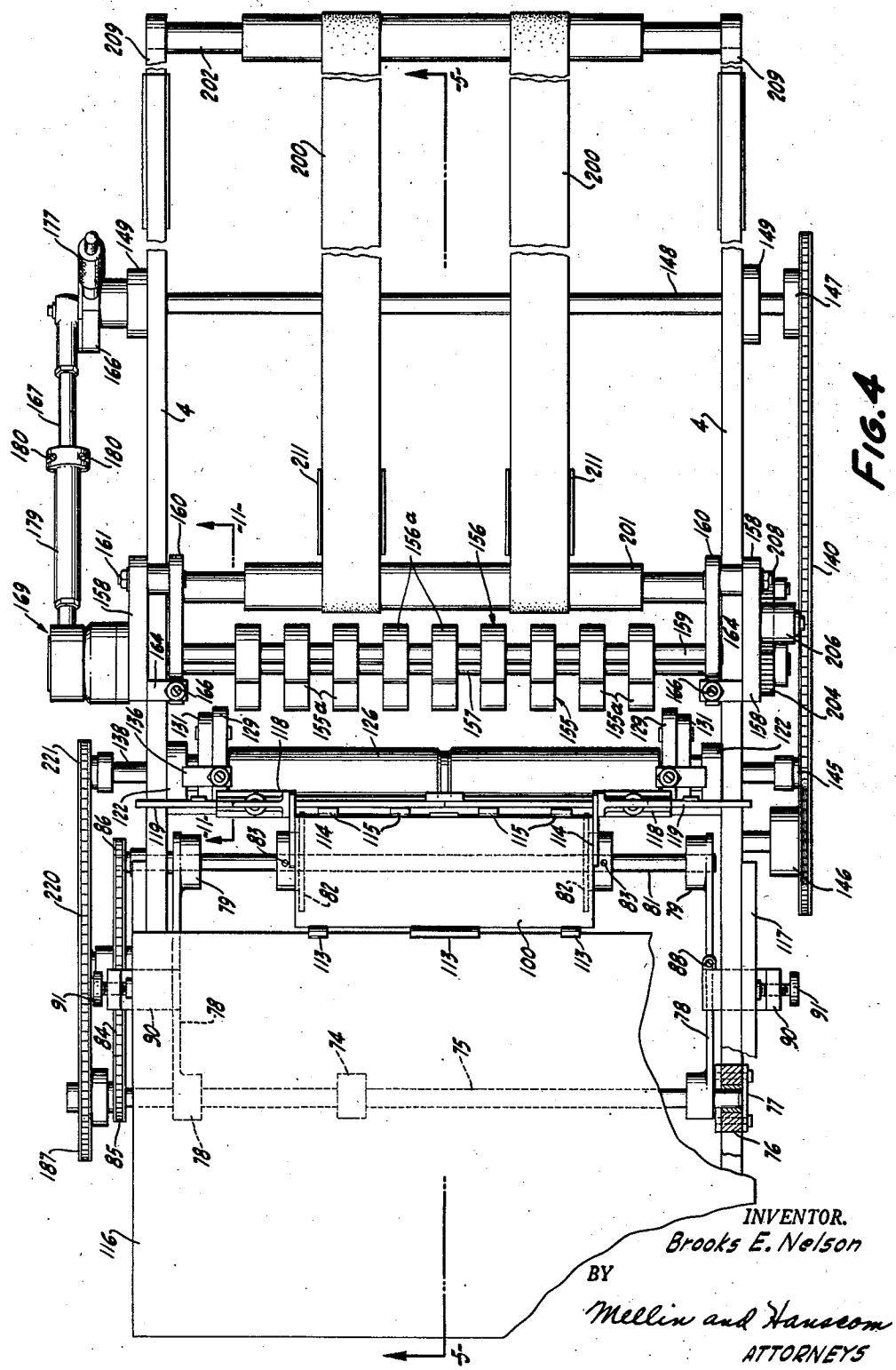


FIG. 4

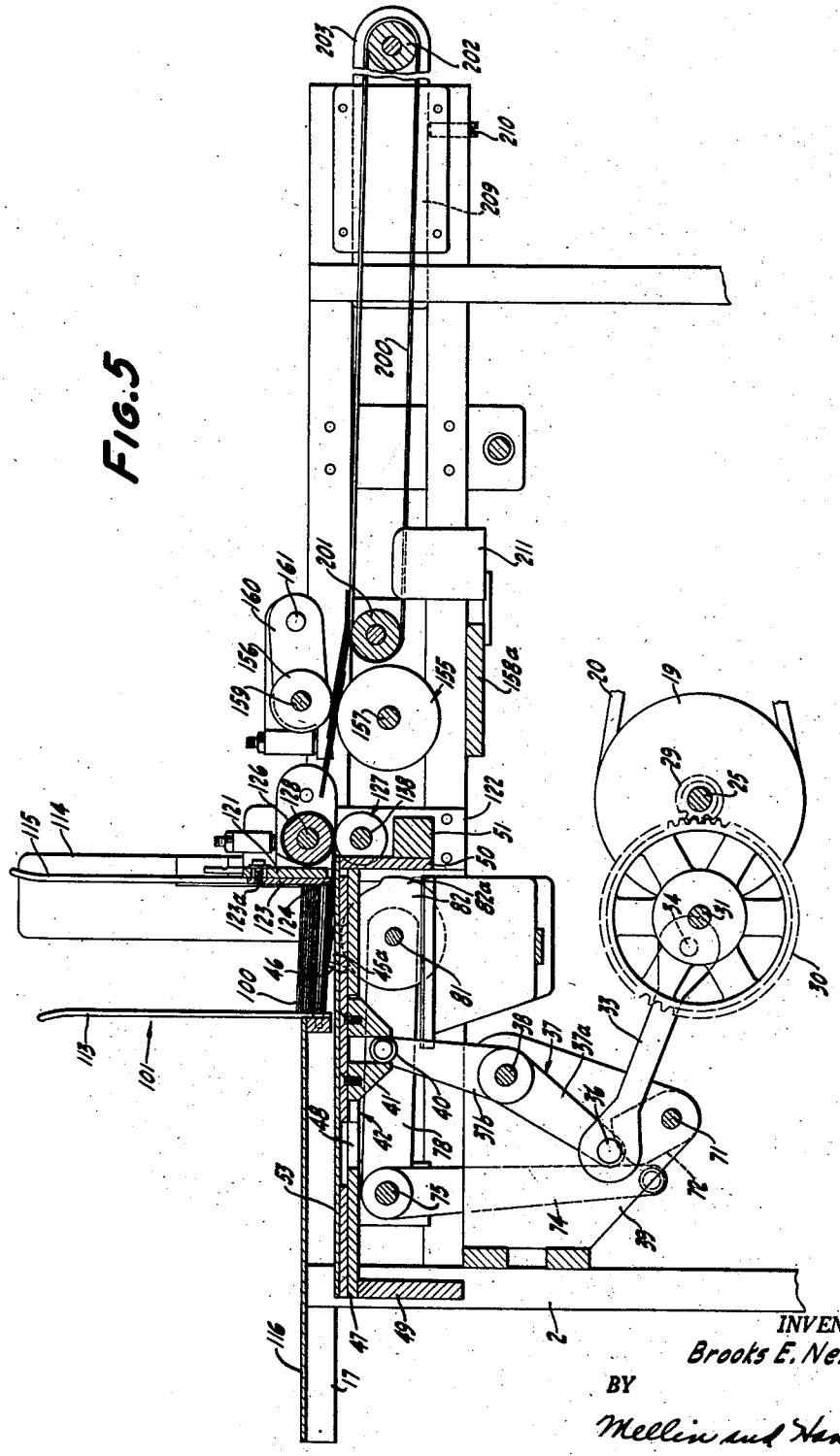
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June 2, 1953 B. E. NELSON 2,640,695

CARD OVERLAP AND ADHERING MACHINE

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FIG. 5



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CARD OVERLAP AND ADHERING MACHINE

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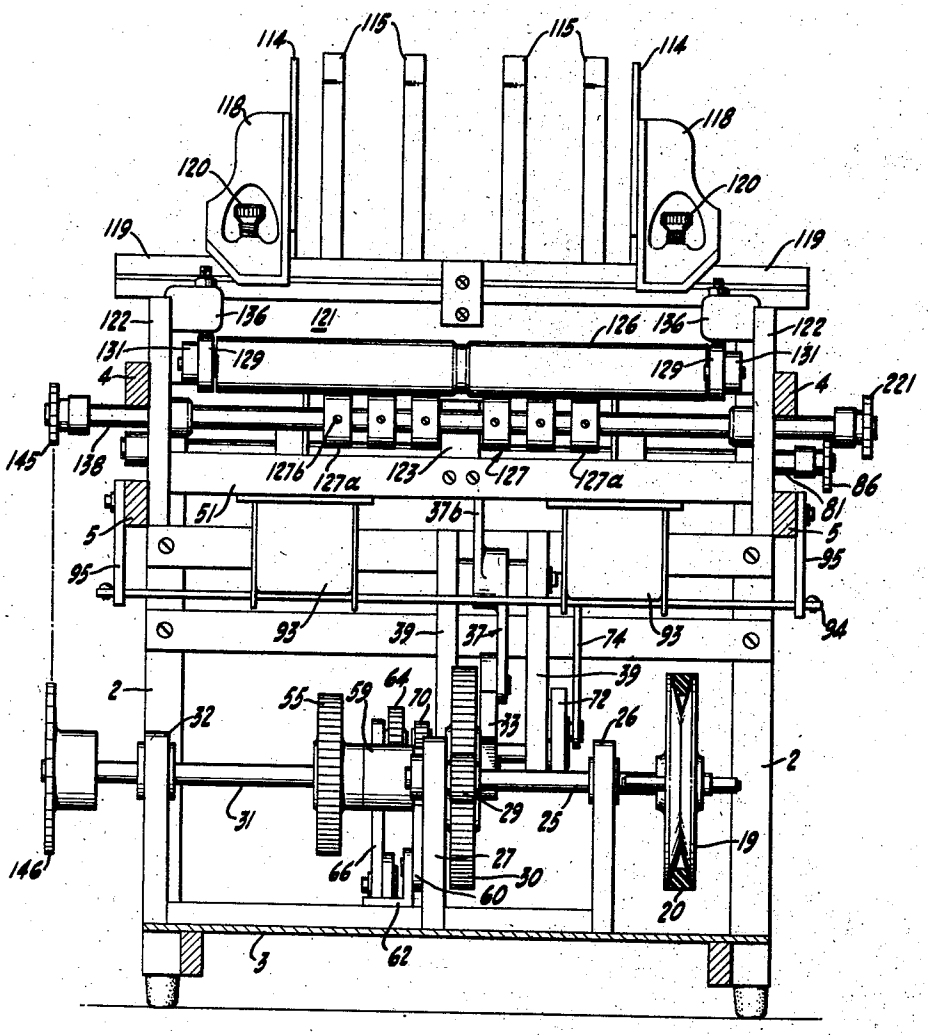


FIG. 6

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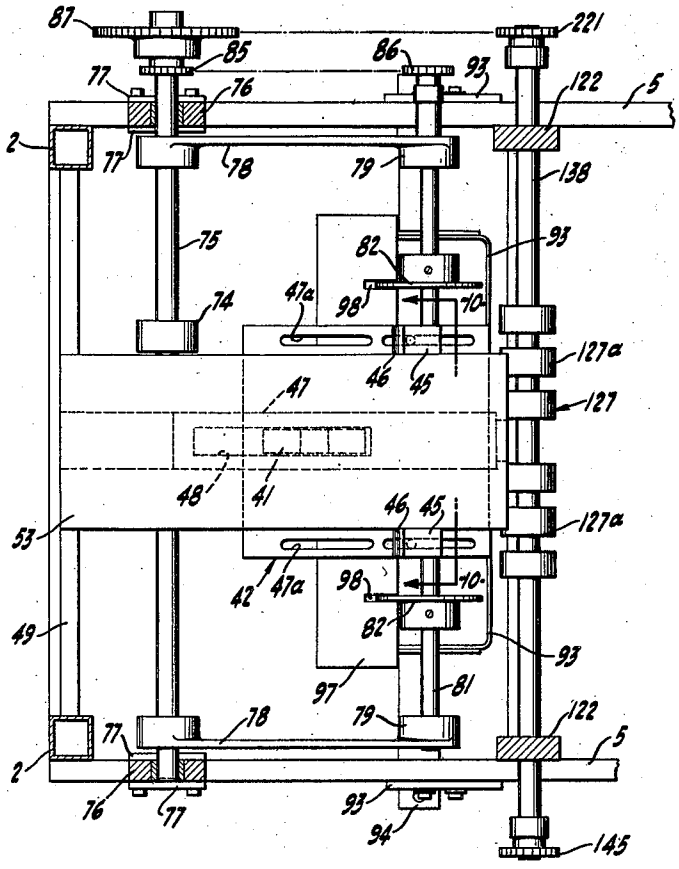
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CARD OVERLAP AND ADHERING MACHINE

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FIG. 7



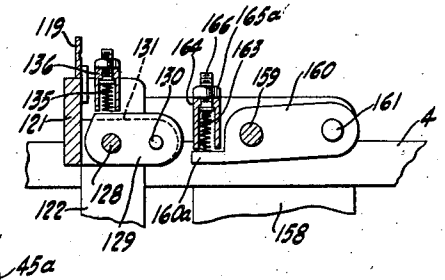


FIG. 10

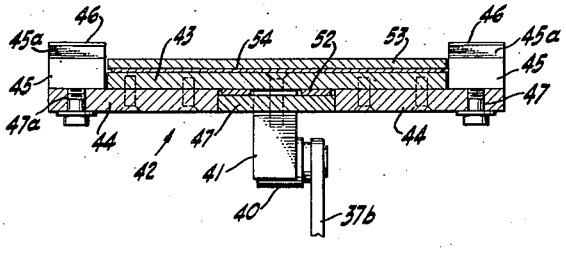


FIG. 11

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Patented June 2, 1953

2,640,695

UNITED STATES PATENT OFFICE

2,640,695

CARD OVERLAP AND ADHERING MACHINE

Brooks E. Nelson, Cleveland, Ohio, assignor to Jaymac Systems, Incorporated, Cleveland, Ohio, a corporation of Ohio

Application June 14, 1948, Serial No. 32,898

21 Claims. (Cl. 270—58)

1

This invention relates to an overlap machine for gluing together papers, cards, and the like, in overlapping relationship.

More particularly, this invention relates to a machine for gluing together in overlapping relationship, cards used for keeping business records, such as time records, payroll records and records of production and inventory.

In cards of the character described, it may be desired to glue together a set of cards at their side edges or at their top edges. Or it may be desired to glue together a set of cards at opposing side edges so as to form a series of overlapping pockets.

In an overlap machine designed to receive individual cards, to apply glue to a predetermined area on each card and to overlap the cards and apply pressure to glue them together in overlapping relationship, it is desirable that the machine operate rapidly and accurately; that it be adjustable to accommodate cards of any size within a broad range of sizes; that it be adaptable with a minimum of interchange of parts and adjustment to accommodate cards of a wide variety of sizes and shapes; and that it be adaptable with a minimum of change to the particular needs of a job and to rapid adjustment to any degree of overlapping.

It is an object of the invention to provide an improved form of overlap machine of the character described.

It is a further object of the invention to provide an overlap machine of the character described, which is easily and rapidly adjustable to glue together a set of cards or the like in overlapping relationship, the cards in any one set varying from two to any desired higher number, and wherein the degree of overlapping is infinitely variable within wide limits.

It is a still further object of the invention to provide a machine of the character described wherein the various unit operations, such as feeding the cards to a gluing unit, applying glue to the cards, and overlapping and applying pressure to the glued cards, are synchronized, and wherein a minimum of interchange and adjustment of parts is required to accommodate the machine to different requirements.

These and other objects of the invention will be apparent from the ensuing description and the appended claims.

One form of the invention is exemplified in the following description and illustrated by way of example in the accompanying drawings, in which:

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Fig. 1 is a side elevation of the machine of the invention.

Fig. 2 is a side elevation of the same as viewed from the opposite side of the machine.

Fig. 3 is a horizontal section taken along the line 3—3 of Fig. 1, showing the motor and certain of the power transmission elements in plan view.

Fig. 4 is a plan view of the machine.

Fig. 5 is a longitudinal section taken along the line 5—5 of Fig. 4.

Fig. 6 is a vertical section taken along the line 6—6 of Fig. 1.

Fig. 7 is a plan view of the glue applicator element with the feed hopper removed.

Fig. 8 is a section taken along the line 8—8 of Fig. 1, showing details of a clamp element.

Fig. 9 is a detailed view, on an enlarged scale and broken away, of the ratchet clutch employed to actuate the indexing roll.

Fig. 10 is a section taken along the line 10—10 of Fig. 7, showing details of construction of the slide table.

Fig. 11 is a longitudinal section taken along the line 11—11 of Fig. 4, showing the lever supports for certain of the rolls employed in feeding and indexing the cards.

Referring now to the drawings, and more particularly to Figs. 1, 2 and 3, the main framework 1 comprises posts 2, a bed plate 3 secured to the posts 2, and spaced upper and lower guide rails 4 and 5 secured to the upper ends of the posts 2 and extending somewhat beyond the posts at one end of the machine. Power is provided by a motor 10 which is mounted upon slides 11 and 11*a* carried on guide rails 12, which are anchored to angle beams 13 and 13*a*. As shown more clearly in Fig. 3, a screw 14 having a knob 15 is provided for adjusting the position of the motor. The screw 14 is threaded through a nut 16 which is in threaded engagement with and firmly secured to the outer guide 11, and it also passes through the outer angle beam 13 and is adjustably locked in position by shaft collars 16*b* and set screws 16*a*. It is thus apparent that the position of the motor 10 may be readily adjusted by sliding it along the guides 12, and that it may be locked in any desired position, such adjustment being to vary the speed of the machine as and for the purpose explained hereinafter.

Secured to the motor shaft 17 is a variable pitch pulley 18, and trained about the pulley 18 and a fixed diameter pulley 19 is a V-belt 20. The pulley 19 is secured to a countershaft 25

journaled in bearing stands 26 and 27, which are suitably bolted to the main framework. A pinion 29 secured to the opposite end of shaft 25 meshes with a gear 30 carried on a shaft 31 which is journaled in bearing stands 27a and 32, both of which are suitably bolted to the framework.

A feeder slide mechanism generally designated as 42 (see Fig. 5) is acuated by means of a connecting rod 33 (see Figs. 1 and 2) connected eccentrically at 34 to the above-mentioned gear 30 and at its other end, at 36, to one arm 37a of a bell crank lever 37, which is pivotally supported upon a pivot pin 38 secured to one of a pair of spaced bearing brackets 39 secured to the main framework. The other arm 37b of the lever 37 is provided with a roller 40, which engages and actuates a yoke 41 forming a part of the feeder slide mechanism 42.

Referring more particularly to Figs. 7 and 10, the feeder slide mechanism 42 comprises a slide plate 43 to the underside of which the yoke 41 is secured, knife mount holders 44 secured to the bottom of and at opposite sides of the slide plate 43 and knife mounts 45 and a feeder knife 46 secured to each knife mount holder. As shown, the knife mount holders 44 are slotted longitudinally as at 47a to permit longitudinal adjustment of the knife mounts 45. Each knife mount 45 has a forwardly and downwardly sloping surface 45a, and each feeder knife 46 is secured adjustably by any suitable means (not shown) so as to project slightly above the rear edge of its mount. Also, a guide bar 47 is supported underneath the slide plate 43 and between the knife mount holders 44, being slotted longitudinally as at 48 to accommodate the yoke 41, and being supported at the rear by frame members 49 and forwardly by a plate 50 (see Fig. 5) secured to a transverse bar 51, which is secured to bearing plates 122. Bronze slide bearings 52 are disposed between the guide bar 47 and slide plate 43, and as also shown, a bed plate 53 is provided, being spaced from the slide plate 43 by a spacer 54 and being supported rearwardly and forwardly by the frame members 49 and the plate 50.

The motor 10 is in constant operation during operation of the machine; hence, the countershaft 25 and the gears 29 and 30 are constantly rotated. It will thus be seen that, through the medium of the connecting rod 33 and bell crank lever 37, the feeder slide mechanism 42, including the feeder knives 46, will be reciprocated, for the purpose of feeding forward individual cards in timed sequence as and for the purpose described hereinafter.

A glue applicator element, including glue cams 82, and described in detail hereinafter, is actuated by means of a gear 55 secured to the above-mentioned shaft 31. The gear 55 meshes with a gear 56 secured to a shaft 57, which also carries a pinion 58. The shaft 57 is held by a lever 59, which is secured at one end to the above-mentioned shaft 31 and is free to rotate thereon. The lever 59 is adjustably clamped in any desired position by means of a second lever 60 supported at 61 upon a block 62 secured to the main framework. The lever 60 is provided with a slot 60a and it is adjustably clamped to the lever 59 by means of a clamp screw 63 engaging the slot 60a.

The pinion 58 is in mesh with a change gear 64 carried on a shaft 65, the shaft 65 being carried by a lever 66 adjustably secured at 67 to a bracket 68 bolted to the main framework. The shaft 65 also carries a pinion 69 which meshes with a second change gear 70 carried on a shaft 71 which is journaled in the bearing brackets 39.

The shaft 71 also carries a glue interrupter cam 72 having a circular cam surface 72a, and as the cam 72 rotates, the surface 72a engages a roller 73 on the free end of a lever 74. The lever 74 is clamped to a pivot shaft 75 journaled in bearing blocks 76, which are adjustably clamped to the above-mentioned guide rails 4 and 5 by means of guides 77. Also clamped to the pivot shaft 75 are spaced glue cam supporting levers 78. Bearings 79 formed at the other ends of levers 78 carry a glue cam shaft 81. Any desired number of glue cams 82, shown for purposes of illustration as two in number, are adjustably clamped to the glue cam shaft 81, as by means of set screws 83. Each glue cam is contoured according to the gluing requirements and, as illustrated in Fig. 5, is provided with a rise or high point 82a.

As shown more clearly in Fig. 2, the cam shaft 81, and with it the glue cams 82, are rotated continuously by a chain 84 trained about sprockets 85 and 86. The sprocket 86 is keyed to the cam shaft 81, while the sprocket 85 is clamped to the hub of a larger sprocket 87 which is carried on the pivot shaft 75 and is free to rotate thereon. The sprocket 87 is driven, and thus serves to drive the sprockets 85 and 86, in the manner explained hereinafter.

Proper positioning of the glue cams 82 is maintained by means of stop screws 88 (see Fig. 1) and a spring 89 (see Figs. 2 and 8). Stop screws 88 are carried by brackets 90 clamped to the upper guide rails 4 by screws 91a. The stop screws 88 bear against the upper surfaces of the glue cam levers 78 and thus limit the upward movement of these levers and of the glue cams 82. Spring 89 is carried by a threaded pin 89a received within a socket (not shown) in the main framework. The outer, threaded end of the pin 89a is bolted to a bracket 92 which is secured to the lever 74, and any desired compression is exerted on the spring 89 by means of nuts 92a.

It will be seen, that as the sprocket 86 on the cam shaft 81 is rotated, and as the train of gears 29, 30, 55, 56, 58, 64, 69 and 70 is actuated by the motor 10, the glue cams 82 will constantly rotate about the axis of the glue cam shaft 81 and they will also oscillate through a predetermined vertical arc. As explained in detail hereinafter, the train of gears thus employed, and the cam and lever elements cooperating therewith to translate rotary motion of the motor 10 into oscillatory motion of the cams 82, serve to time the application of glue to the cards and to allow easy interchange of gears to conform to different timing requirements.

A supply of glue is maintained at the desired level in a glue pot 93. The glue pot 93 is carried on a support bar 94, which is secured to side plates 95 adjustably bolted to the lower guide rail 5, as shown. The glue cams 82 dip into the glue pot 93, and the amount of glue deposited on the cards by the glue cams is determined by a wiper blade 97 (see Fig. 7), which is secured to the glue pot 93 and is provided with slots 98 through which the cams rotate. As the glue cams rotate through the slots 98, excess glue is wiped therefrom by the edges of the slots.

Cards 100 are stacked in a hopper 101 and are fed from the bottom of the stack as described in detail hereinafter. The hopper 101 comprises rear guides 113, side guides 114 and front guides 115. The rear guides are secured to a plate 116

guided by flanges 117 for sliding along the upper surfaces of guide rails 4, the thumb screws 91 serving to clamp the flanges, and thus the plate 116 and the rear guides 113, in any desired position. The side guides 114 are secured to slide 118 which ride on a rail 119, clamp screws 120 being provided to clamp the guides 114 in any desired position. The rail 119 is supported upon a plate 121 extending across the machine and, in turn, secured to bearing plates 122, which are bolted to the upper and lower guide rails 3 and 4. The front guides 115 are also secured to the plate 121, which also carries a throat blade 123 bolted at 123a for vertical adjustment, as shown.

It is thus apparent that the hopper 101 is adjustable to accommodate cards of any size or shape within the limits of the machine. Also, the adjustable throat blade 123 may be set to provide a throat 124 between its bottom edge and the bed plate 53, such as to allow passage therethrough of only one card at a time.

In operation, as thus far described, a supply of cards 100 is maintained in the hopper 101 and glue is maintained in the glue pot 93 at the desired level. The glue cams 82 constantly rotate and at properly timed intervals they are depressed by glue interrupter cam 72 and the levers 78 so as to allow a card to be fed forwardly without application of glue, thus marking off and delineating a set of glued, overlapping cards. The bottom-most card is supported upon the sloping surfaces 45a of the knife mounts 45 and is fed forwardly by the feeder knives 46 through the throat 124 for subsequent operations.

The cards 100 are next fed to transfer rolls 126 and 127. The upper transfer roll 126 is a solid roll which extends the width of the machine and is carried on a shaft 128 which is supported by levers 129. Each lever 129 is pivotally supported upon a pin 130 held in a pad 131 secured to the adjacent bearing plate 122 (see Figs. 4 and 11). Springs 135, each contained in a housing 136 secured to one of the plates 122, exert a pressure upon the levers 129 sufficient to hold the upper transfer rolls 126 firmly against the lower transfer rolls 127. The latter roll is in the form of segments 127a (see Fig. 6) which are carried by a shaft 138 journaled in the bearing plates 122. The segments 127a are adjustably secured to the shaft 138, as by set screws 127b, to allow variable spacing in accordance with glue pattern requirements. The upper transfer roll 126 is driven by frictional engagement with the lower transfer roll 127 which, in turn, is driven by a chain 140 trained about sprockets 145, 146 and 147. As shown in Fig. 1, the sprocket 145 is carried on the lower transfer roll shaft 138, the sprocket 146 on the shaft 31 and the sprocket 147 on a shaft 148 which is journaled in bearing plates 149 bolted to the guide rails 4 and 5.

As stated hereinabove, and referring to Fig. 2, the cam shaft 81 is driven by sprocket 85, chain 84 and sprocket 86, sprocket 85 being secured to the hub of a larger sprocket 87. The latter is driven by a chain 220 trained over the sprocket 87, a sprocket 221 secured to the lower transfer roll shaft 138 and a sprocket 222 carried by a take-up lever 223 secured at 224 to the lower guide rail 5 for angular adjustment to allow for variable spacing of the sprockets 87 and 221.

The cards 100 are transferred by the transfer rolls 126 and 127 to the nip of a pair of rolls comprising an indexing roll 155 and a squeeze roll 156. As shown in Fig. 4, the indexing roll 155 is a segmental roll having segments 155a

carried on a shaft 157 journaled in bearing plates 158. The bearing plates 158 are carried by a clamping plate 158a which may be bolted to the lower guide rails 5 at any desired longitudinal position. The squeeze roll 156 is also a segmented roll having segments 156a carried on a shaft 159 which is journaled in levers 160. The levers 160 are pivotally supported by pins 161 engaging slots 162 formed in the plates 158 (see Figs. 2, 5 and 11). Springs 163 contained in housings 164 secured to the plates 158 bear against extensions 160a of levers 160 and serve to hold the squeeze roll 156 firmly in contact with the indexing roll 155, the compression of the springs 163 being adjustable by means of screws 165 and nuts 165a. The compression of the squeeze roll 156 against the indexing roll 155 is thus adjustable, and it will also be noted that the axis of the squeeze roll 156 is parallel to but is disposed forwardly of the axis of the indexing roll 155 for a purpose explained hereinafter; also, that the degree of advancement of the squeeze roll is adjustable by means of the slotted connection 161, 162.

Referring to Fig. 2, the indexing roll 155 is driven by the shaft 148, an adjustable throw crank 166, a connecting rod 167 and a crank or clamp 168 clamped to a ratchet clutch 169, which is secured to the indexing roll shaft 157. The throw of the crank 166 is variable by reason of a slide 175 engaging a slot 176 formed in the crank and by means of a micrometer screw 177 which is operable to move the slide 175 in the slot 176. Rod ends 178 and 179 serve to connect the connecting rod 167 to the cranks 166 and 168, the rod end 179 being adjustably clamped by a screw 180 to vary the effective length of the connecting rod 167.

The crank or clamp 168, as shown more clearly in Fig. 9, is clamped to the outer race 181 of the ratchet clutch 169 by means of set screws 182, and the inner race 183 is clamped to the roll shaft 157 by means of a set screw 184. A ball 185 carried in a recess 186 formed in the inner race is urged outwardly by a spring 187 received in a socket 188.

It will thus be seen that a ratchet connection is provided between the indexing roll shaft 157 and the reciprocating rod 167, and that on reciprocation of the latter, the indexing roll shaft 157 and indexing roll 155 will be advanced by angular increments, which are uniform and are adjustable merely by turning the micrometer screw 177.

As stated, each card 100, as it reaches the bottom of the stack in hopper 101, drops upon the inclined surfaces 45a of the knife mounts 45. Glue is applied to the undersurface of the bottom card by the glue cams 82, which are constantly rotated in the glue in the glue pot 93 and are lowered at properly timed intervals to allow a card to pass through unglued to mark the division between sets of cards. The feeder knives 46 feed each card forwardly, through the throat 124, into the nip of transfer rolls 126 and 127. These rolls feed each card forwardly and positively into the nip of the squeeze roll 156 and indexing roll 155. As shown in Fig. 5, because of the axial offsetting of these last-mentioned rolls (the squeeze roll being advanced with respect to the indexing roll), each card engaged with these rolls will be tilted downwardly. This provides clearance for the next oncoming card, and it also prevents the oncoming card from scraping glue off the preceding card.

As also stated, the indexing roll 155 is advanced by angular increments by means of the crank 166, connecting rod 167 and ratchet clutch 169. Thus, by suitable adjustment of the throw of the crank 166, any desired degree of overlapping is obtainable.

As a set of overlapping cards is completed, it is deposited upon conveyor belts 200 trained about shafts 201 and 202 which are journaled, respectively, in the bearing plates 158 and in bearings 203. The shaft 201, hence the conveyor belts 200, are driven by a gear train consisting of a gear 204 on the index roll shaft 157, an idler gear 205 carried by a pad 206 secured to the bearing plate 158, and a pinion 208 on the shaft 201. The bearings 203, which carry the conveyor belt shaft 202, are formed in bars 209 (see Fig. 2), which slide between the guide rails 4 and 5 and are clamped in the desired position by clamp screws 210. Guides 211 (see Figs. 4 and 5) secured to the clamping plates 158a serve to keep the belts in the desired position.

The machine thus described provides numerous advantageous features, among which the following may be mentioned.

The machine is operable to glue either or both edges of a card, and the pattern of application of glue is variable within wide limits. Also, cards may be glued together in a continuous strip or in sets of two up to twenty-five, or even more, depending upon the train of change gears. All of the driven elements of the machine are driven off of the countershaft 25, the speed of which is variable without varying the speed of the motor 10 merely by sliding the motor inwardly or outwardly along the guide rails 12 so as to vary the pitch of the variable pitch pulley 18. The number of cards glued together in a set is controlled by the gear train 55, 56, 58, 64, 69 and 70, which pivot the glue cams 82 and are in a predetermined ratio with the gear 30, which reciprocates the feeder slide assembly 42. Of the gear train 55, 56, etc., only the two change gears 64 and 70 require replacement. Thus, a set of only two gears needs to be kept on hand. If, for example, it is desired to glue together six cards in a set, the ratio between the gear train 55, 56, etc., on the one hand, and the gear 30, on the other hand, will be six-to-one, such that the shaft 31 revolves six times for one revolution of the shaft 71; i. e., such that the glue cams 82 are pivoted away from the gluing station during each sixth stroke of the feeder slide assembly. Also, in such case, the cam surface 72a of the glue interrupter cam 72 will be an arc of approximately 60°, or one-sixth of a revolution of the interrupter cam shaft 71, such as to hold glue cams 82 away from the sixth card. Merely by substituting larger or smaller change gears at 64 and 70, the ratio between the shafts 31 and 71 is varied as desired. The pivotable levers 59 and 66 supporting the shafts 57 and 65 permit proper meshing of any desired set of change gears 64 and 70 with their mating pinions 58 and 69. In addition to substituting other change gears 64 and 70 to modify the machine for a different set of gluing requirements, a set of glue interrupter cams 72 will also be kept on hand for substitution of this element, in accordance with varying requirements.

Stop screws 88 govern the height limit of glue cams 82 and the adjustable connections 77 supporting the bearing blocks 76, which carry the glue cam pivot shaft 75, provide for longitudinal adjustment of the glue cams 82 relative to the leading and trailing edges of the cards 100, thus permitting control of overlapping. Thus, the smaller the degree of overlapping desired, the farther the glue cams must be moved forward relative to the leading edge of the card. Also, the length or degree of arc of the rise 82a on the glue cams 82 contributes to determining the length of the glue pattern.

The timing of the feeder slide assembly 42 is such that the feeder knives 46 engage the trailing edge of the bottom card 100 at the moment the glue cams 82 contact the card and move the card forwardly to the transfer rolls 126 and 127. Inasmuch as the amplitude or stroke of the slide plate 43 is a constant, provision has been made for adjusting the position of the knife mounts 45 relative to the slide plate 43. As stated, the inclined surfaces 45a of the knife mounts 45 present a suitable surface for engaging a card with the feeder knives 46. The latter are adjusted to project above the upper edge of the surfaces 45a a distance slightly less than the thickness of a card.

As stated, the transfer rolls 126 and 127 feed the cards positively into the nip of the indexing roll 155 and squeeze roll 156, thus serving to straighten any card which may have become disaligned during the feeding movement and ensuring uniform registration of the cards. The segments 127a of the lower transfer roll 127 are spaced so as not to contact glued portions of the cards, and these segments are adjustably secured to the lower transfer roll shaft 138 so as to accommodate any desired glue pattern. Also, the transfer roll 127 (which is the driving roll) is driven at a sufficient peripheral speed to transfer the longest card from the feeder knives 46 to the indexing and squeeze rolls 155 and 156 before the following card is fed to the transfer rolls.

As stated, the adjustable throw crank 166 accurately and nicely controls the indexing movement of the indexing rolls 155, and thus accurately governs the degree of overlapping. Also, the ratchet clutch 169 permits only forward and intermittent rotary movement of the indexing roll 155. The whole indexing assembly, including indexing roll 155 and squeeze roll 156, being carried in bearing plates 158 and clamped to the framework by means of clamping plates 158a, can be adjusted longitudinally of the machine in accordance with varying requirements. Also, the adjustable mounting at 162 of the squeeze roll 156 permits adjustment of the angle of tilt of the cards, thus ensuring proper clearance of cards of any size or shape. Springs 163 compressing the squeeze roll 156 against the indexing roll 155 allow a variable spacing of these rolls to accommodate cards of different thickness and also to accommodate different degrees of overlapping. The indexing roll 155 and the squeeze roll 156 perform the dual functions of indexing and of applying pressure to the glued joints to bond them together.

While I have shown the preferred form of my invention, it is to be understood that various changes may be made in its construction by those skilled in the art without departing from the spirit of the invention as defined in the appended claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A machine for assembling a plurality of cards in overlapping relationship comprising a

glue applicator pivotally supported for pivoting to and from a gluing station for selectively applying glue to certain of said cards, a feed member operable to feed each card individually and consecutively forwardly from the gluing station, and means for pivoting said applicator away from said gluing station in timed relationship with respect to said feed member so as to allow each nth card to be fed forward without application of glue, n being an integer not less than 2.

2. The machine of claim 1, wherein said feed member is a reciprocable member, said machine including a main drive shaft, means driven by said main drive shaft and operable to reciprocate said reciprocable feed member and means including a gear train operatively connecting said main drive shaft and said pivoting means, said gear train including at least one change gear adapted to be removed and replaced by another and different change gear to vary the value of n.

3. In a machine for assembling a plurality of cards in overlapping relationship including a card receptacle, a feed member located below said receptacle and adapted to feed forward cards or the like in sequence and a rotary glue applicator member located below said receptacle and adapted to contact said cards during the feeding thereof, the improvement which comprises a pivotal support for said rotary member, means for rotating said rotary member, and means for pivoting said rotary member out of engagement with said cards, said means being synchronized with the feeding of said cards so as to pivot said rotary member out of engagement with each nth card, n being an integer not less than 2.

4. A glue application machine, comprising a card stack receptacle, a rotary glue applicator member arranged below said receptacle, a pivotal support for said member, a reciprocable feed member arranged below said receptacle and adapted by reciprocation to engage and feed forward each of a supply of cards as delivered thereto, a main drive shaft, means operatively connecting said main drive shaft with said reciprocable member to reciprocate the same, and pivoting means driven by said main drive shaft and operable to pivot said rotary member out of engagement with said cards, said pivoting means including at least one change gear which is changeable to vary the timing of such pivotal movement relative to reciprocation of said reciprocable member.

5. A glue applicator machine, comprising a reciprocable feed member adapted to receive cards or the like and to feed each card forwardly individually by reciprocation through a gluing station, a rotary glue applicator located at said station adapted to apply glue or the like to each card, a pivotal support for said glue applicator, a main drive shaft, a gear driven by said main drive shaft, link and lever means operatively connecting said gear and said reciprocable member to reciprocate the same, means operatively connecting said drive shaft and said pivotal support to pivot the same so as to disengage said rotary applicator from said cards, said means comprising a train of gears driven by said drive shaft, a rotary cam driven by said gears and a lever actuated by said cam and connected to said pivotal support to pivot the same, said train of gears including at least one change gear adapted to be removed and substituted by another and different change gear to vary the timing of pivotal movement of said rotary applicator in relation to reciprocation of said reciprocable feed member.

6. An overlap machine comprising an indexing roll and a second roll forming a bight therewith each supported for rotary movement about its longitudinal axis, means for successively feeding cards into the bight of the roll along a path of travel in a substantially horizontal plane, said rolls being disposed with their longitudinal axes in parallelism, said rolls being disposed so that the tangent to the roll at the point of contact of the roll is inclined downwardly with respect to the direction of card travel, a rotary drive member, and means operatively connecting said rotary drive member and said indexing roll for rotating the same, said means including a rod, a crank and a ratchet clutch, said ratchet clutch being operable to impart intermittent rotary motion to said indexing roll.

7. A card overlapping and gluing machine comprising a main drive shaft, a rotary glue applicator supported for pivotal movement to and from a gluing station, means normally holding said applicator in a first pivotal position at said gluing station, a reciprocable feed member operable to engage and feed forward each glued card as supplied thereto, an indexing mechanism including an indexing roll supported for rotary movement, said indexing mechanism being operable to receive each card as fed thereto and to compress successive, glued cards together in overlapping relation, a first transmission means operatively connecting said drive shaft and said reciprocable feed member operable to reciprocate the latter, a second transmission means including at least one change gear operatively connecting said drive shaft and said glue applicator operable to pivot the latter to a second pivotal position removed from said gluing station, said first means and second means having a predetermined ratio such as to pivot said glue applicator to said second pivotal station at every nth forward stroke of said reciprocable member, n being an integer not less than 2, said change gear being removable for substitution of another and different change gear to change the value of n, and a third transmission means operatively connecting said drive shaft and said indexing roll operable to rotate said roll in angular increments, said third means being adjustable to vary the angular increment.

8. The machine of claim 7, wherein said third transmission means includes a rotary member, a variable throw crank secured thereto, a rod connected at one end to said crank and a ratchet clutch secured to the other end of said rod and to the shaft of said indexing roll.

9. A card overlapping and gluing machine comprising a main drive shaft, a rotary glue applicator supported for pivotal movement to and from a gluing station, means normally holding said applicator in a first pivotal position at said gluing station, a reciprocable feed member operable to engage and feed forward each glued card as supplied thereto, a pair of rolls including a squeeze roll and an indexing roll supported in parallelism for rotary movement, a first transmission means including a rotary member and a lever operatively connecting said drive shaft and said reciprocable feed member operable to reciprocate the latter, a second transmission means including a gear train comprising pivotally supported gears and at least one change gear operatively connecting said drive shaft and said glue applicator

operable to pivot the latter to a second pivotal position removed from said gluing station, said first means and second means having a predetermined ratio such as to pivot said glue applicator to said second pivotal position at every nth forward stroke of said reciprocable member, n being an integer not less than 2, said change gear being removable for substitution of another and different change gear to change the value of n and said pivotally supported gears being pivotable to other positions to maintain proper meshing of the gear train after such substitution, and a third transmission means operatively connecting said drive shaft and said indexing roll, said third means including a rotary member, a variable throw crank secured thereto, a rod connected at one end to said crank and a ratchet clutch secured to the other end of said rod and to the shaft of said indexing roll.

10. A device of the class described, comprising an indexing roll and a second roll forming a bight therewith, the rolls being supported for rotary movement about parallel axes, means separate from the rolls having a linear feed movement in a direction along a plane disposed at a slight angle to the plane which is normal to the plane containing the axes of the rolls and operable to successively feed a series of cards into the bight of the rolls along a path contained in the first-mentioned plane, and means for intermittently advancing the indexing roll in timed relation to feeding of the card by successive increments, each being less than the direction-of-travel dimension of a card to thereby overlap the cards and tilt the cards at an angle to said path of travel of the cards to enable a successive card to be inserted into the bight.

11. The device as set out in claim 10 in which said second roll is yieldably urged toward the indexing roll.

12. The device as set out in claim 11 in which there are means for selectively applying glue to certain of said cards prior to the insertion of a card into the rolls.

13. A device of the class described, comprising an indexing roll and a second roll forming a bight therewith, the rolls being supported for rotary movement about parallel axes, means separate from the rolls having a linear feed movement in a direction along a plane disposed at a slight angle to the plane which is normal to the plane containing the axes of the rolls and operable to successively feed a series of cards into the bight of the rolls along a path contained in the first-mentioned plane, and means for intermittently advancing the indexing roll in timed relation to feeding of the card by successive increments, each being less than the direction-of-travel dimension of a card to thereby overlap the cards and tilt the cards at an angle to said path of travel of the cards to enable a successive card to be inserted into the bight, and means for selectively applying glue to certain of said cards prior to the insertion of the cards into the rolls.

14. A device of the class described comprising an indexing roll and a second roll forming a bight therewith, the rolls being supported for rotary movement about parallel axes, a reciprocable feed member for successively feeding a series of cards in planar condition toward the bight of the rolls along a path disposed at an angle to the plane containing the axes of the rolls, means for reciprocating the reciprocable feed member, and means for intermittently advancing the indexing roll in timed relation to the feeding means by successive increments, each being less than the direction-of-travel dimension of a card to thereby overlap the cards and tilt the cards at an angle to said path of travel of the cards to enable a successive card to be inserted into the bight.

15. A device of the class described comprising an indexing roll and a second roll forming a bight therewith, the rolls being supported for rotary movement about parallel axes, a reciprocable feed member for successively feeding a series of cards in planar condition toward the bight of the rolls along a path disposed at an angle to the plane containing the axes of the rolls, means for reciprocating the reciprocable feed member, means for intermittently advancing the indexing roll in timed relation to the feeding means by successive increments, each being less than the direction-of-travel dimension of a card to thereby overlap the cards and tilt the cards at an angle to said path of travel of the cards to enable a successive card to be inserted into the bight, and means for selectively applying glue to certain of said cards prior to the insertion of a card into the rolls.

16. A device of the class described comprising an indexing roll and a second roll forming a bight therewith, the rolls being supported for rotary movement about parallel axes, means having a linear feed movement in a direction along a plane rectilinearly disposed at a slight angle to the plane which is normal to the plane containing the axes of the rolls and operable to successively feed a series of cards in planar condition into the bight of the rolls along a rectilinear path contained in the first-mentioned plane, and means for intermittently advancing the indexing roll in timed relation to feeding of the card by successive increments, each being less than the direction-of-travel dimension of a card to thereby overlap the cards and tilt the cards at an angle to said path of travel of the cards to enable a successive card to be inserted into the bight.

17. A device of the class described comprising an indexing roll and a second roll forming a bight therewith, the rolls being supported for rotary movement about parallel axes, a reciprocable feed member for successively feeding a series of cards in planar condition toward the bight of the rolls along a path disposed at an angle to the plane containing the axes of the rolls, means for reciprocating the reciprocable feed member, a pair of transfer rolls disposed between the reciprocable feed member and the indexing and second rolls operable to receive cards from the reciprocable feed member and insert the cards into the nip of said indexing and second rolls, means for intermittently advancing the indexing roll in timed relation to feeding of the cards by successive increments, each being less than the direction-of-travel dimension of a card to thereby overlap the cards and tilt the cards at an angle to said path of travel of the card to enable a successive card to be inserted into the bight, and means for actuating said transfer rolls in timed relation to movement of the feed member and indexing and second rolls.

18. The device as set out in claim 17 in which said second roll is yieldably urged toward said indexing roll and in which there are means for selectively applying glue to certain of said cards prior to the insertion of a card into the rolls.

19. In an apparatus of the character set forth, means for holding a vertical stack of cards with

the lowermost card of the stack having a lower surface exposed, a rotary and bodily movable gluing roller located beneath and in line with the stack holder, reciprocating means for successively moving each lowermost card in forward movement in its own plane from the stack, means for selectively applying the gluing roller to selected cards during their forward movement, an indexing roll and a second roll forming a bight therewith, the rolls being supported for rotary movement about parallel axes, means for feeding cards from the reciprocating means to the rolls along a path disposed at an angle to the plane containing the axes of the rolls, and means for intermittently advancing the index roll in timed relation to feeding of the cards by successive increments, each being less than the direction-of-travel dimension of a card to thereby overlap the cards and tilt the cards at an angle to said path of travel of the cards to enable a successive card to be inserted into the bight.

20. A device of the class described, comprising an indexing roll and a second roll forming a bight therewith, the rolls being supported for rotary movement about parallel axes, means for successively feeding a series of cards into the bight of the rolls along a path disposed at an angle to the plane containing the axes of the rolls, and means for intermittently advancing the indexing roll in timed relation to feeding of the card by successive increments, each being less than the direction-of-travel dimension of a card to thereby overlap the cards and tilt the cards at an angle to said path of travel of the cards to enable a successive card to be inserted into the bight, a glue applicator pivotally supported for pivoting to and from a gluing station for selectively applying glue to certain of said cards, means for pivoting said applicator away from the gluing station in timed relationship with respect to the feeding means so as to allow certain cards to be fed forwardly without the application of glue, said means for pivoting said applicator including a gear train including at least one change gear adapted to be removed and replaced by another and different change gear to change the manner of skipping of the cards.

21. A device of the class described comprising an indexing roll and a second roll forming a bight therewith, the rolls being supported for rotary movement about parallel axes, means for successively feeding a series of cards into the bight of the rolls along a horizontal path, said rolls being disposed so that the tangent to the rolls at the point of contact of the rolls is inclined downwardly with respect to the direction of card travel, and means for intermittently advancing the indexing roll in timed relation to feeding of the card by successive increments, each being less than the direction-of-travel dimension of a card to thereby overlap the cards and tilt the cards at an angle to said path of travel of the cards to enable a successive card to be inserted into the bight.

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