Nov. 20, 1945. C. D. RYAN 2,389,551

APPARATUS FOR FEEDING AND EJECTING ENVELOPES

Original Filed Dec. 2, 1941 7 Sheets-Sheet 1

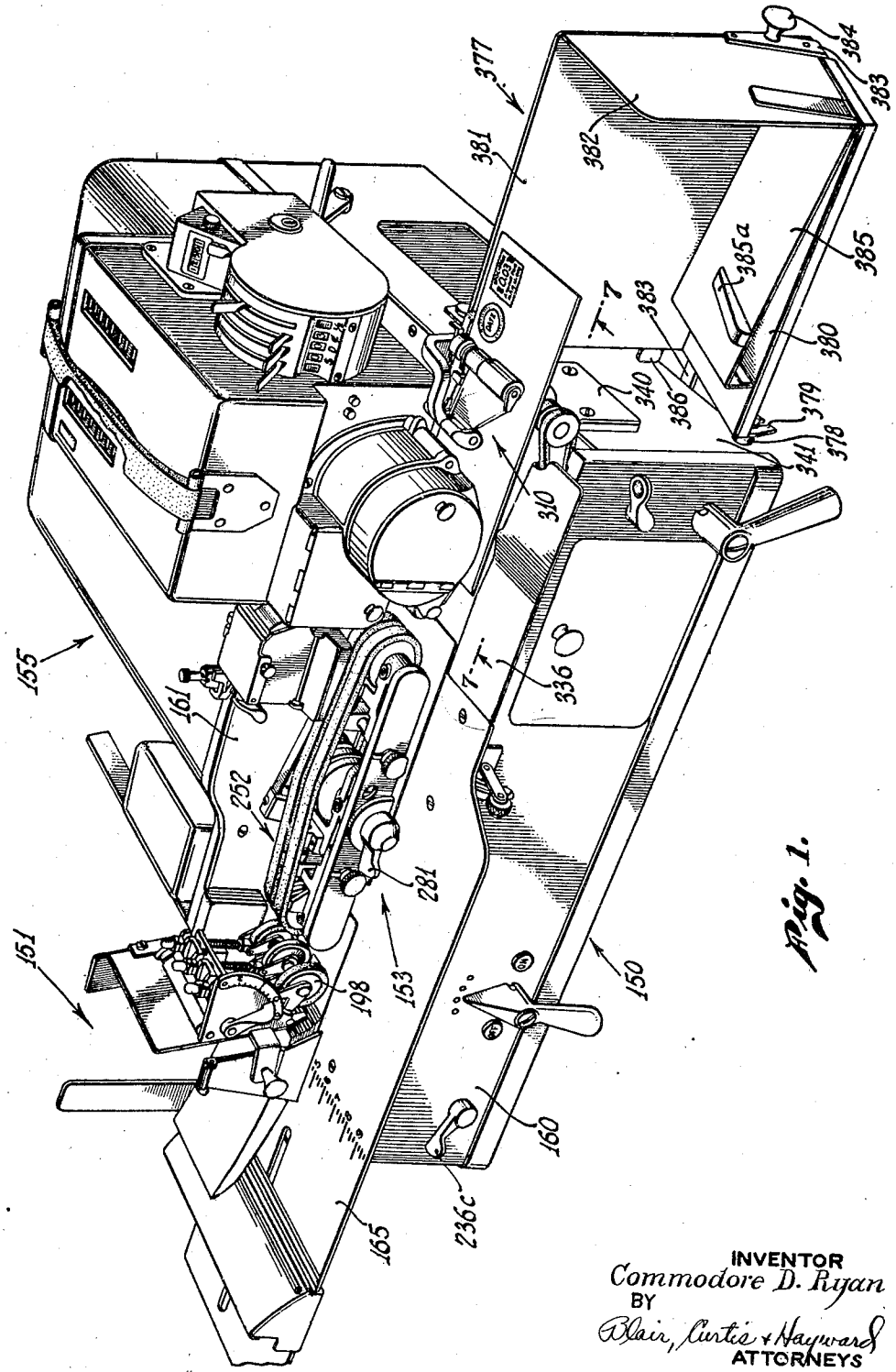


Fig. 1.

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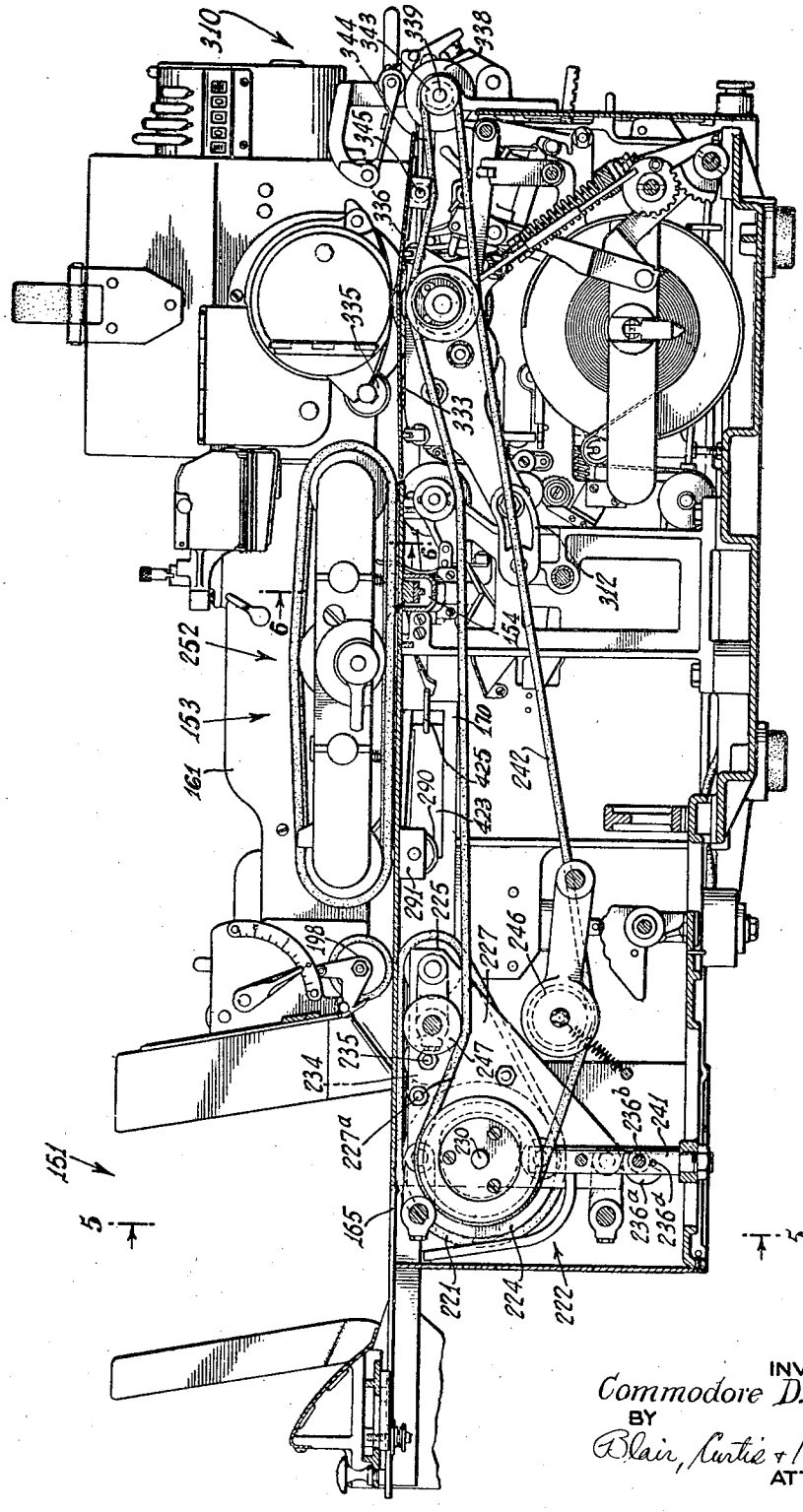


Fig. 2.

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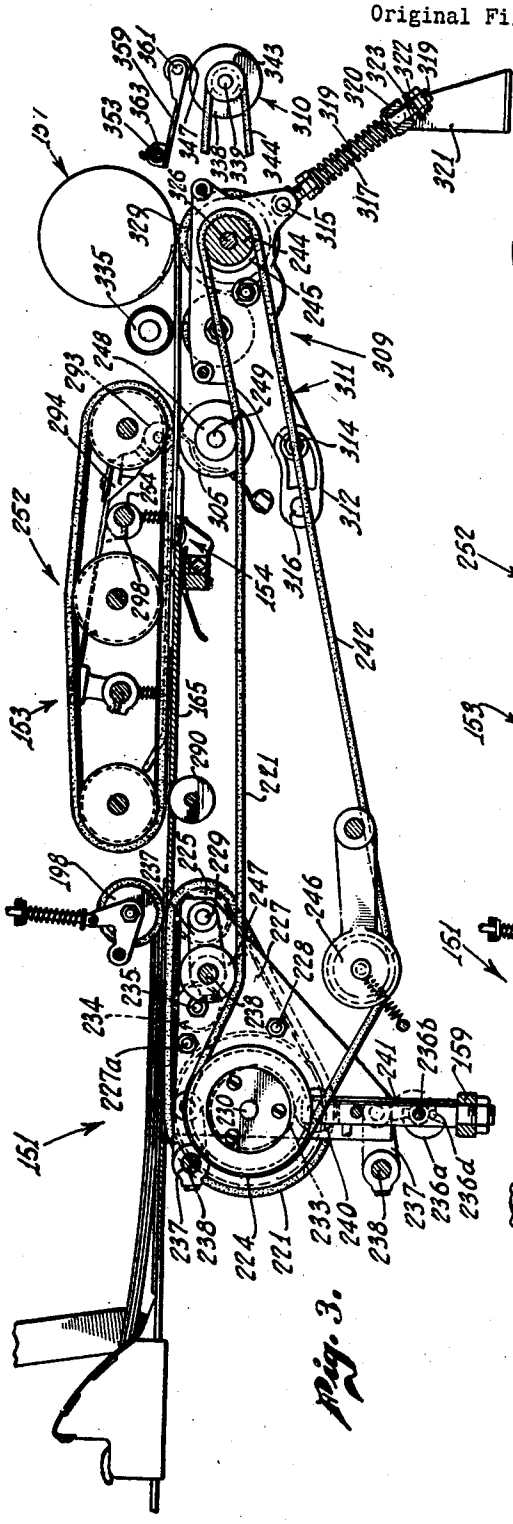


Fig. 3.

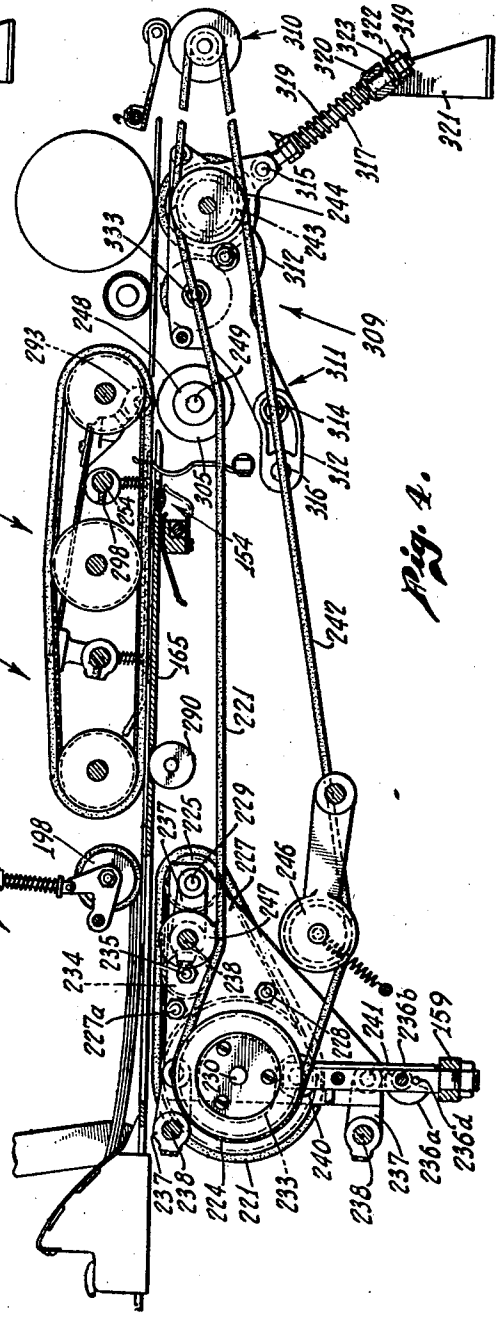


Fig. 4.

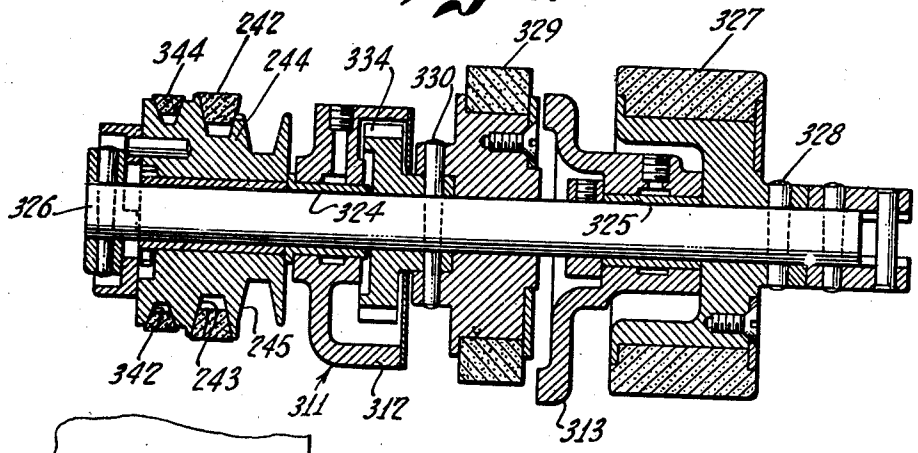
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APPARATUS FOR FEEDING AND EJECTING ENVELOPES

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Fig. 10.



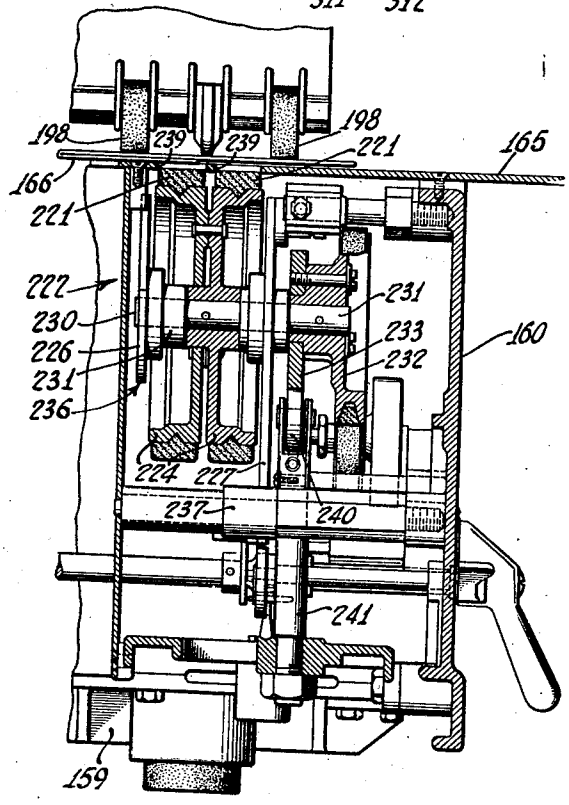


Fig. 5.

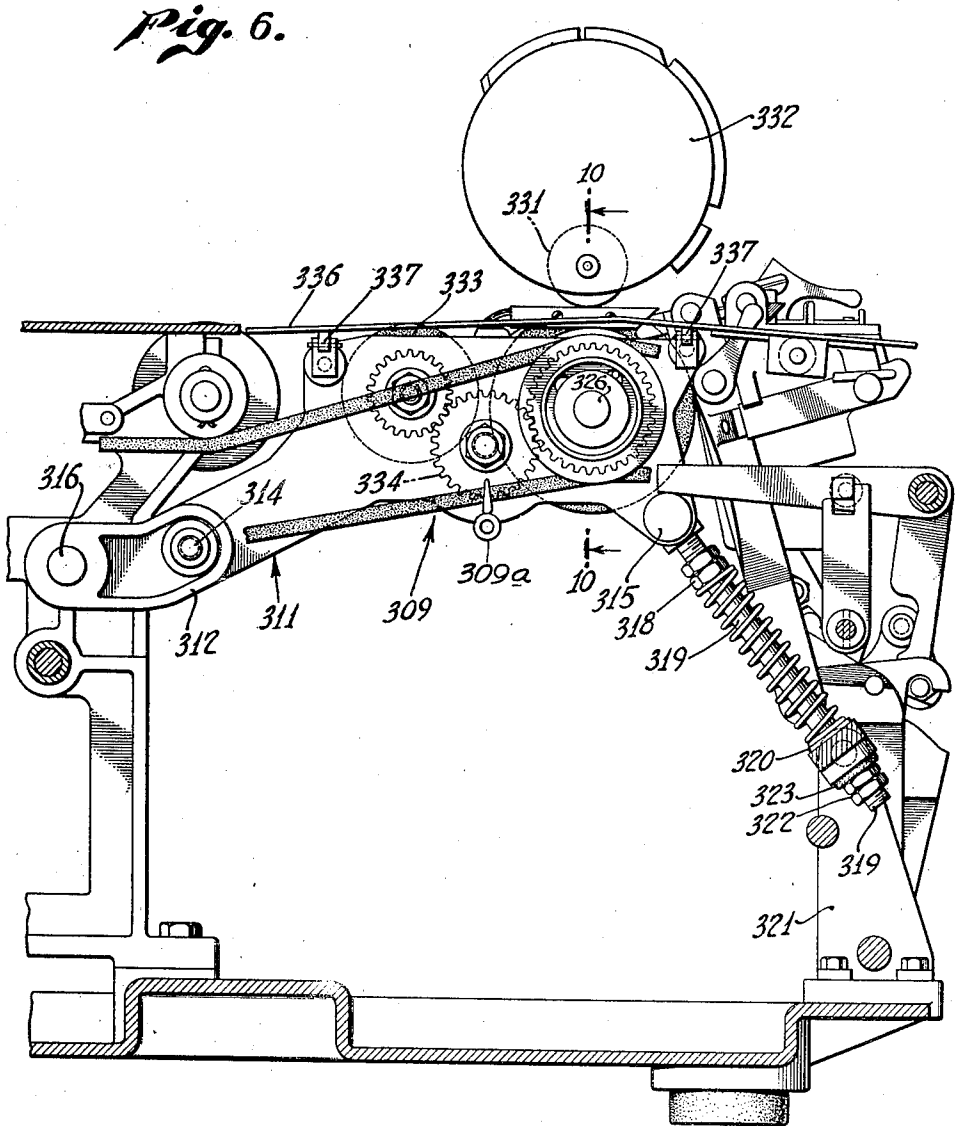
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APPARATUS FOR FEEDING AND EJECTING ENVELOPES

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Fig. 6.



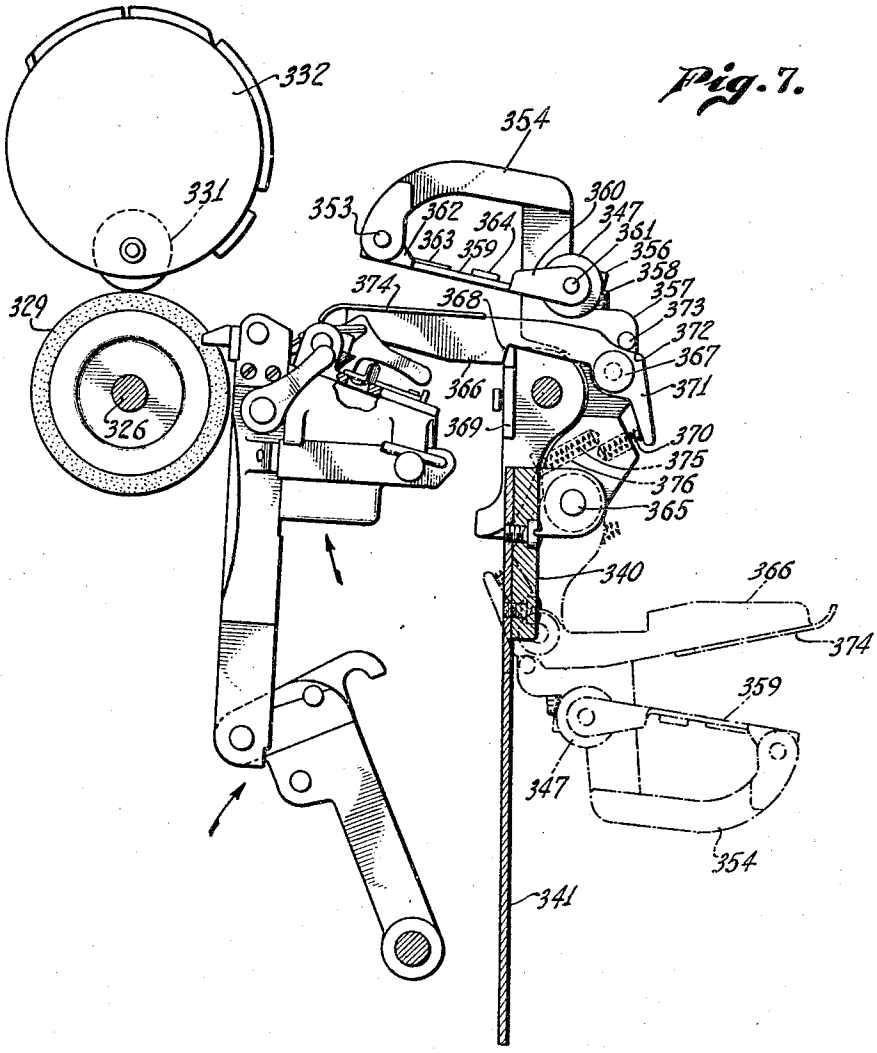
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Fig. 7.



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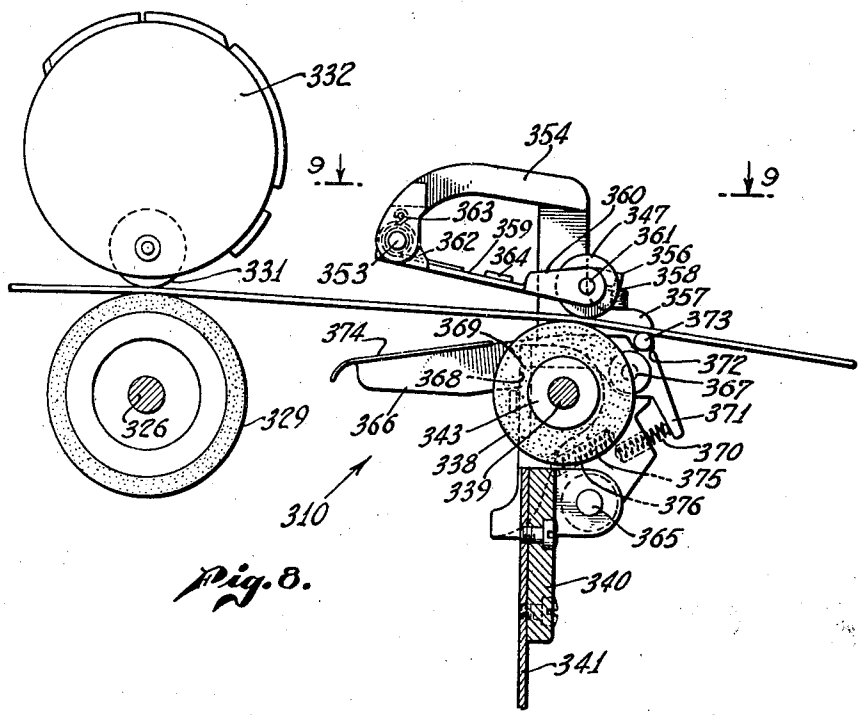


Fig. 8.

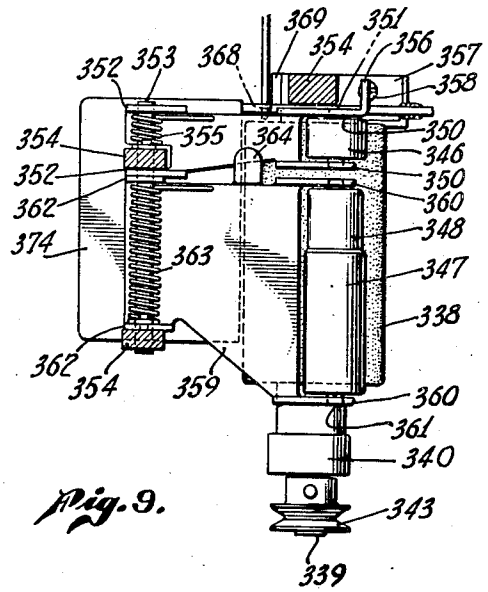


Fig. 9.

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Patented Nov. 20, 1945 2,389,551

UNITED STATES PATENT OFFICE

2,389,551

APPARATUS FOR FEEDING AND EJECTING ENVELOPES

Commodore D. Ryan, Los Angeles, Calif., assignor to Commercial Controls Corporation, a corporation of Delaware

Original application December 2, 1941, Serial No. 421,321. Divided and this application October 16, 1942, Serial No. 462,262

7 Claims. (Cl. 271—35)

This invention relates to apparatus for feeding mail matter through and ejecting it from a mail treating machine.

One of the objects of this invention is to provide envelope feeding and ejecting apparatus for a mail treating machine which is simple and sturdy in construction and capable of efficient operation at a high rate of speed. Another object is to provide apparatus of the above nature capable of efficiently handling envelopes and cards of various widths, lengths, and thicknesses without mutilation thereof. Another object is to provide apparatus of the above nature which can be safely operated at high speed in feeding mail matter from the receiving end of the machine and ejecting it at the delivery end thereof. Other objects will be in part apparent and in part pointed out hereinafter.

This application is a division of the application of Commodore D. Ryan, Serial No. 421,321, filed December 2, 1941.

The invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts as will be exemplified in the structure to be hereinafter described and the scope of the application of which will be indicated in the following claims.

In the drawings, in which there is shown one embodiment of the invention,

Figure 1 is a perspective view of the mail treating machine;

Figure 2 is an enlarged sectional elevation of the machine shown in Figure 1, showing the envelope feed hopper, the stripper, and the envelope conveying mechanism;

Figure 3 is a fragmental sectional elevation similar to Figure 2, showing the driving means for the envelope feed conveyor set for slow feed operation, preferably used when treating relatively long envelopes;

Figure 4 is a view similar to Figure 3 but showing the driving means for the envelope conveyor set for high speed operation, which is preferably used for treating relatively short envelopes;

Figure 5 is a fragmental sectional view taken substantially along the line 5—5 of Figure 2;

Figure 6 is a fragmental sectional view showing in enlarged detail certain portions of the mechanism shown in the lower right-hand part of Figure 2;

Figure 7 is an enlarged fragmental sectional view taken generally along the line 7—7 of Figure 1 to illustrate the relation between the final sealing rollers and the printing drum, and illustrating the manner in which the pressure roller is automatically released to swing to its retracted position when the tape feeding device is moved to its operative feeding position;

Figure 8 is a fragmental sectional view similar to Figure 7 but not including the tape feeding device;

Figure 9 is a sectional view taken substantially along the line 9—9 of Figure 8; and,

Figure 10 is a fragmental sectional view taken substantially along the line 10—10 of Figure 6 showing the platen roller, its driving shaft, and associated parts.

Similar reference characters refer to similar parts throughout the several views of the drawings.

As shown in Figure 1, the mailing machine is provided with a conveyor table 165 which is spaced a short distance from the intermediate frame plate 161 of the machine in order to provide space for the depending flaps of the envelopes conveyed by the conveying mechanism to be described hereinafter.

As shown in Figure 5, an envelope 166 is shown in position on conveyor plate 165 to be conveyed along the conveyor table. When envelope 166 is unsealed, its flap hangs down over the inner edge of the conveyor plate 165 in the space between the conveyor plate and the intermediate frame plate 161 (Figure 1).

As shown in Figure 1 an envelope feeding hopper 151 is arranged adjacent the left-hand end of conveyor table 165 and beneath the hopper is a metering mechanism generally indicated at 222 (Figure 2) capable of being operated at either one of two different speeds. This metering mechanism delivers the envelopes into the conveying system, and as the conveyor system may be divided into three different units, namely, metering, conveying and ejecting, the description and construction of the system will follow this same plan of division.

The metering portion 222 of the conveyor system includes a pair of spaced feed belts 221 (Figure 5) which feed belts may be formed of rubber or other suitable material. At one end the two belts are played around a pair of large driving pulleys 224 (Figures 3, 4 and 5), mounted below the envelope hopper and at their opposite ends around a pair of small idler pulleys 225 positioned adjacent the front end of the envelope feed hopper and preferably slightly in advance of the stripper mechanism discs 198.

The driving and idler pulleys are mounted within a suitable frame comprising an inner plate 226 and a main supporting plate 227 (Fig-

ures 4 and 5) which plates are inter-connected by tie bolts 228 and support at their forward ends the axle 229 upon which the idler rollers 225 are journaled. The drive shaft 230 (Figure 5) upon which the two large driving pulleys 224 are fastened is journaled in frame bearings 231. The driving shaft 230 extends through the frame supporting plate 227 and carries the driving pulley 232, which pulley, in turn, is provided with a lift cam 233 operating in the manner to be described for raising and lowering the metering portion of the conveyor system to feed envelopes from the hopper. In order to provide additional support for the envelope engaging run of the conveyor belts 221, a pair of rollers 234 are journaled upon axle 235 carried by side plates 226 and 227 of the metering device frame.

This metering device frame 236 is mounted for limited vertical movement, by providing two stub shafts 227a extending from the supporting plate 227 and which stub shafts together with axle 229 are pivotally carried by the free end of three supporting levers 237 which levers are in turn pivotally mounted upon studs 238 extending inwardly from the front frame plate 160 of the machine. Through the provision of the three frame supporting levers 237, the metering device frame 236 may be bodily raised to lift the top run of the feed belts 221 into engagement with the under surface of the lowermost envelope in the stack and to thereby apply a sufficient driving force to carry the engaged envelope under the stripper discs 198 while the succeeding envelopes are held back by said stripper discs. This action will deliver the envelope to the second portion of the conveyor system, whereupon the metering device frame will be lowered to in turn lower the feed belts 221 out of engagement with said envelope and will be lifted thereafter to meter out a second envelope in the manner above described. The envelope conveyor plate 165 is provided with two parallel slots 239 (Figure 5) in order to permit the feed belts 221 to be raised into contact with the lowermost of envelopes placed in the feed hopper.

The mechanism for raising and lowering the metering device may include an elevating cam 233 (Figures 3, 4 and 5) which cam as previously stated, is securely fastened to the driving pulley 232 and during its rotation cooperates with a cam roller 240 which roller is mounted upon the upper end of a suitable post 241 extending upwardly from the main base plate 159 of the machine in the manner shown in Figures 2 and 5. Referring to Figure 3, it may be observed therein that the lift portion of the elevating cam 233 has engaged the cam roller 240 and has thereby caused the metering device to be elevated into its feeding position while in Figure 4, the elevating cam is shown rotated to present its low portion to the cam roller 240 and as a result, the frame will be lowered to the position shown in this figure so that the two feed belts 221 will clear the lowermost envelope placed within the feed hopper. Through the use of the elevating cam 233 and cam roller 240, the metering device is lifted to feed an envelope from the hopper for each revolution of the driving pulley 232.

The metering portion of the conveyor system is provided with an independent driving mechanism whereby it may be driven at relatively high or low speeds when treating long or short envelopes. In Figure 3, the driving means for the metering portion of the conveyor system is shown as it would appear when arranged to drive the metering device at low speed, while in Figure 4, the driving means is shown as it would appear when adjusted for high speed drive. By reference to Figures 2, 3 and 4, it may be observed that the driving mechanism for the metering portion 222 of the conveyor system 153 includes a belt 242 engaging the metering device driving pulley 232 at one end and at its opposite end engaging the larger diameter groove 243 (Figures 4 and 10) of the two-step pulley 244 of the power plant driving mechanism 155 when the metering device is to be driven at high speed. The belt may be shifted by a belt shifter 309a (Figure 6) reciprocably mounted in a frame 311 to engage the smaller diameter groove 245 when the metering device is to be driven at low speed. In order to maintain at all times the proper tension in the driving belt 242 whether the belt engages the larger or smaller groove in the power plant step pulley 244, a spring weighted tape-up pulley device 246 is employed as shown in Figures 2, 3 and 4, and is supported from the front frame plate 160.

The metering device is operated at low speed when feeding standard long envelopes through the machine. The speed of operation of the metering device is timed with respect to other portions of the conveyor system so that a gap of sufficient length is maintained between the envelopes passing through the machine to provide space for the envelope trip fingers to swing into operative position when released from one envelope before being engaged by the following envelope. Through this timing, it is obvious that the leading end of each successive envelope will be spaced a uniform distance apart. Therefore, it follows that for shorter envelopes, the gap between the trailing edge of one envelope and the leading edge of the following envelope will be increased in proportion to the decrease in length of said envelopes. Consequently, when operating on the standard short envelopes, the distance between the envelopes will be greater than necessary for the return of the tripping device. Therefore, it is desirable to speed up the metering device with relation to the other portion of the conveyor system so that the gap between said envelopes is reduced, thus permitting a greater number of envelopes to be fed through the machine for a given period of time.

When envelopes are to be sealed without printing postage values thereon, the metering device 222 of the envelope feed conveyor system may be maintained in its elevated position as shown in Figure 3 to continuously feed the envelopes from the feed hopper thereby greatly increasing the speed of operation of the machine.

To maintain the metering device 222 in its elevated position for the purpose of sealing, cam 236a is carried by the inner end of an actuating shaft 236b journaled adjacent its cam end in the cam roller post 241 and extending through the front frame plate 160 (Figure 1) to carry a control handle 236c. The elevating cam 236a is of the shape best shown in Figures 2, 3 and 4, and when in its retracted position engages a stop pin 236d which extends from post 241 and while in this position its cam surface is clear of the supporting frame 227 of the metering device 222. When the elevating cam 236a is turned by means of its control handle 236c to its broken line position, as shown in Figure 3, the lift portion of this cam will engage the bottom edge of the metering device supporting plate 227 and will lift and maintain

said device in its elevated position, as shown in Figure 3, thereby maintaining the feed belts **221** in continuous contact with the lowermost envelopes stacked in the hopper, and thereby feeding them out in rapid succession without space between.

As illustrated in Figure 3, when the elevating cam **236***a* has been rotated to its elevating position as shown in broken lines in this figure, one of the shoulders formed in the cam will engage the stop pin **236***d* to thereby maintain the cam in its adjusted position.

The top run of the driving belt **242** is depressed by means of idler pulleys **247** and **248** to clear the envelope flap moistening device **154**, as is clearly shown in Figures 3 and 4. The idler pulley **247** is journaled upon one of the stub shafts **238**, while the idler pulley **248** is journaled upon the sealer roller shaft **249** (Figures 3 and 4) which shaft is journaled in the intermediate frame side plate **161** and bracket **250**, which extends upwardly from base **159** of the main frame.

The second portion of the conveyor mechanism includes the conveying means for receiving the envelopes from the metering device **222** and conveying the envelopes through the flap moistening device **154** (Figure 3) and delivering the envelopes to the printing drum of the meter. This portion of the conveyor system is specifically described in the above-noted application, and includes a hold-down truck mechanism generally referred to by the reference number **252** (Figures 1 and 2).

The final ejecting portion of the envelope conveyor system **153** receives the envelopes from the hold-down truck mechanism **252** and operates to convey the envelopes past the printing drum and finally to eject the treated envelopes from the machine. This portion of the envelope conveyor system, which we have referred to as the final ejecting portion of the conveying system comprises a platen roller mechanism generally indicated at **309** (Figure 4) and a final sealing and ejecting roller device generally indicated at **310**.

The platen roller mechanism **309** is arranged to automatically maintain the proper pressure against the printing drum of meter **157** for treating the full range of envelope thicknesses permissible by the capacity of the machine. The platen roller mechanism **309** includes a swing frame **311** comprising a front plate **312** and a rear plate **313** (Figure 10) maintained in spaced relation by suitable spacer bolts **314** and **315** (Figures 3, 4 and 6), and the two plates forming the swing frame are pivotally mounted upon pivot shaft **316** and said swing frame is yieldingly maintained in its normal position of rest by compression spring **317** acting between a pair of lock nuts **318** carried by push rod **319** and pivot block **320**, pivotally supported between the front frame plate **160** of the machine and bracket **321** (Figures 3 and 4). The upper end of push rod **319** is pivotally connected to the spacer bolt **315**, as may be observed in Figures 3 and 4, while its lower end is provided with a pair of adjusting nuts **322**. A resilient washer **323** is mounted on rod **319** between the adjusting nuts and pivot block to cushion the engagements of said adjusting nut against said block when the swing frame **311** is returned to its raised position.

Referring more particularly to Figure 10, the swing frame is provided with bearings **324** and **325** in which the platen drive shaft **326** is journaled. The platen roller **327** is keyed upon the inner end of shaft **326** by means of a suitable tapered pin **328**. An ejector roller **329** is positioned between the front and rear swing frame plates **312** and **313** and is mounted on and keyed to shaft **326** by taper pin **330**. The platen and ejector rollers may be rubber-tired as shown in the drawings.

When the machine is set for sealing envelopes without printing postage thereon, the ejector roller **329** cooperates with a small idler roller **331** (Figure 8) journaled in the printing drum **332** of the meter to convey the envelope past the printing station and to present the envelope to the final sealing and ejecting rollers **310**. This same action is attained upon completion of the printing operation.

The swing frame **311** is provided with a power driven rubber-tired conveyor roller **333** and is driven from the platen shaft **326** through a suitable train of gears **334** (Figures 6 and 10). An idler roller **335** mounted in the printing drum housing (Figure 2) cooperates with the roller **333** of the swing frame to assist in conveying the mail matter to and through the printing station. Envelope supporting plate **336** (Figures 1, 2 and 6) is connected to swing frame front plate **312** by hinge means **337** (Figure 6) which operate to normally maintain plate **336** in a horizontal plane and permit the plate to be swung upwardly to facilitate shifting of the metering device driving belt **242**.

The final sealing and ejecting device **310** may include a driven rubber-tired roller **338** carried by shaft **339** journaled in bracket **340** (Figures 1 and 8) which bracket is suitably fastened to the left side cover plate **341**. A driving connection is formed between the platen driving shaft **326** and roller shaft **339** which driving connection may include providing the step pulley **244** with a belt groove **342** (Figure 10) and a driven pulley **343** (Figures 3 and 4) fastened to shaft **339** and connecting these two pulleys by means of belt **344**. As may be observed in Figure 2, a belt tightening roller **345** is mounted upon the underside of the envelope supporting plate **336** and acts to maintain a sufficient tension in the driving belt **344**.

Cooperating with roller **338** are two spring weighted pressure rollers, the first of which may be referred to as the creasing roller **346** (Figure 9) and is relatively narrow in width to engage only the flap edge of the envelope to complete the creasing and also assist in the sealing of the flap. The second pressure roller **347** is of greater width and acts to firmly press the moistened flap against the body of the envelope to effect the final sealing thereof. This roller organization also operates to eject the treated mail matter from the machine.

To prevent pressure roller **347** from contacting the newly printed stamp on the envelope, and thereby smearing the impression, the portion **348** (Figure 9) of the roller is of sufficiently reduced diameter to clear said newly printed stamp.

The creasing roller **346** is swingably mounted with relation to the main sealing roller **338** to provide for different thicknesses of mail matter passing between these two rollers. The means for mounting the creasing roller may include a hinge plate **349** bifurcated at its free end, and the bifurcated portions are bent to form vertical bearing flanges **350**. An axle **351** carried by bearing flanges **350** supports the creasing roller **346**. The opposite end of swing plate **349** is bent to form a pair of spaced vertical flanges **352** for hingedly mounting this end of the plate to hinge pin **353** which pin is supported in bracket **354** (Figures 8 and 9). A torsion spring **355** encircles hinge pin

353 and acts between the hinge plate and bracket to yieldingly urge the creasing roller 346 against the sealing roller 338. The innermost of the two bearing flanges 350 is flanged rearwardly to provide a stop lug 356 which lug overhangs an offset portion 357 of bracket 354. Screw-threaded into this portion of the bracket is an adjusting screw 358 against which the stop lug 356 engages to hold said creasing roller in proper clearance relation with respect to said sealing roller. This clearance is just sufficient to hold the creasing roller out of driving engagement with the sealing roller so as not to unduly wear or deform the rubber surface of said sealing roller.

A similar type of hinge plate 359 is provided for swingably supporting roller 347 from bracket 354 and said bracket is provided at its free end with spaced bearing flanges 360 for pivotally supporting roller shaft 361 while the other end of the hinge plate is provided with flanged brackets 362 for pivotally mounting the plate to hinge pin 353 in the manner shown in Figures 8 and 9. A torsion spring 363 surrounds hinge pin 353 between the hinge plate flanges 362 and acts between the plate and bracket 354 to yieldingly urge roller 347 toward the main sealing roller 338. Roller 347 is maintained in the same clearance relation with respect to the main sealing roller 338 as described for the creasing roller 346 by providing the hinge plate 359 with an offset lug 364 overlying so as to rest upon the upper surface of the creasing roller hinge plate 349. The offset lug 364 of swing plate 359 does not prevent roller 347 from being lifted due to irregularities of the mail matter independently of the creasing roller 346.

When the machine is adjusted to print postage indicia upon gummed tape, it is desirable to automatically retract the creasing and pressure rollers 346 and 347 to a position as shown by broken lines in Figure 7, and for this purpose bracket 354 is hinged to the supporting bracket 340 by pin 365. A latch member 366 pivotally mounted upon bracket 354 by hinge pin 367 is provided with a latch notch 368 (Figures 7 and 8) engaging a latch plate 369 securely fastened upon the inner face of the main supporting bracket 340. In order to yieldingly maintain the latch member in latching relation with plate 369, a compression spring 370 is interposed between the latch finger 371 and a suitable bore formed in bracket 354. The latch member is notched as shown at 372 in Figure 7, and a stop pin 373 carried by bracket 354 cooperates with notch 372 to limit the swinging motion in either direction of latch member 366. The latch member 366 is utilized to support a guide plate 374 which operates to guide the envelopes or other mail matter from the platen and ejector rollers to the final sealing roller assembly. The guide plate 374 is preferably formed as shown in Figures 7, 8 and 9. A retracting spring 375 is mounted within a hole 376 drilled into bracket member 354 (Figures 7 and 8). The end of spring 375 which engages the inner end of bore 376 is enlarged to frictionally bind the spring within said bore while the free end of the spring extends a short distance beyond bracket 354 to engage the main supporting bracket 340 when bracket 354 is in its latched position and acts upon release of latch member 366 to supply the force necessary to swing bracket member 354 to its retracted position as shown in broken lines in Figure 7. In this figure the free end of the retracting spring 375 may be seen projecting from bracket member 354 when swung to its retracted position.

The creasing pressure rollers 346 and 347 (Figure 9) are manually returned to their normal operative position, but may be tripped automatically to swing to their retracted position upon removal of the meter or when shifting the tape feeding device from its non-printing to its printing position in a manner described in the application of Frank P. Sager et al., Serial No. 332,305, filed April 29, 1940.

When the final sealing and ejecting device 310 (Figure 1) is in its normal operating position and the machine is set for treating mail matter, a receiving hopper 377 may be attached to end plate 341 of the machine to receive the envelopes or other mail matter as they are ejected from the final sealing and ejector rollers 310. To support the receiving hopper 377 from end plate 341, groove studs 378 are provided (Figures 1 and 2), for receiving the bifurcated flanged brackets 379 formed on the end of the receiving hopper. The receiving hopper may be of any suitable construction, but as shown in Figure 1 of the drawings, may include a body portion consisting of a base 380 together with an integrally associated back plate 381. It may also be provided with an end plate 382 mounted upon slide bar 383 which bar is slidably mounted upon the under surface of the base portion 380 in any suitable manner not shown. The slide bar 383 may be provided with a knob 384 to provide a convenient handle for adjusting the end plate with relation to the hopper. It is desirable to provide the hopper with a false bottom 385 so shaped as to cause the envelopes to stack against the back and end plates thereof. The false bottom may be attached to the end plate in any suitable manner. Preferably there is provided a wedge-shaped block 385*a* which is secured to false bottom 385 and which elevates the stack of mail from the false bottom to facilitate entry of the fingers under the mail when it is ready to be removed from the hopper. As shown in Figure 1, the receiving hopper is provided with lug 386 engaging end plate 341 to provide a third point of support from said plate and thereby stabilizing the hopper.

The conveyor system just described constitutes one of the important features of this invention and operates to efficiently meter, convey and eject envelopes through the treating elements of the machine and is provided with suitable adjustments to enable this system to effectively handle envelopes of various lengths, widths, and thicknesses. In operating the system it is recommended that the mail matter be segregated for value of postage to be printed thereon, for length, width and thickness. With the selection of one of the segregated groups for treatment, the meter will be adjusted to print the selected value of stamp thereon and the envelope feed hopper adjusted to suit the length and width of envelope, the stripper and hold-down truck mechanisms adjusted to suit the thickness of said envelopes, and thereafter the machine may be placed in operation and the envelopes stacked in the feed hopper from which they will be automatically withdrawn and passed through the treating mechanism in the manner described. During the passage of envelopes through the machine, the flaps may be moistened for sealing or left unsealed at the option of the operator.

It does not require special adjustment of the machine to provide for the moistening of the envelope flaps, whether the flaps are of standard or special shape, deep or shallow, long or short.

For those envelopes which are to have their flaps moistened for sealing, the operator need only stack such envelopes in the feed hopper with their flaps nested and hanging down over the envelope supporting plate 165. If the envelopes are not to be sealed, the operator should place the same in the hopper with their flaps folded against the body portion thereof. The envelopes which are to be sealed and those which are not to be sealed may be stacked indiscriminately within the feed hopper in the manner above described, and the flaps of those envelopes which are to be sealed will be automatically moistened while the flaps of the other envelopes will pass free of the moistening device.

From the above it may be seen that I have provided a conveying mechanism which is capable of obtaining the objects set forth hereinabove in an efficient manner.

As many possible embodiments may be made of the above invention, and as many changes might be made in the embodiment above set forth, it is to be understood that all matter hereinbefore set forth, or shown in the accompanying drawings, is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. In a conveyor mechanism for feeding objects from the feed hopper of an object treating machine, a carriage mounted for movement relative to the machine frame, pulley means journaled in the carriage, conveyor belt means for said pulley means, means for driving the conveyor belt means, cam means operatively carried by said carriage and arranged to be driven by said pulley means, and a cam follower fixedly mounted upon the machine frame and arranged to be engaged by said cam means for periodically raising the carriage to lift the upper run of the conveyor belt means above the floor of the hopper to engage and eject the lowermost object from said hopper each time the carriage is raised.

2. In a conveyor mechanism for feeding objects from the feed hopper of an object treating machine; a carriage mounted for movement relative to the machine frame, pulley means journaled in the carriage, conveyor belt means for said pulley means, driving means for said pulley means, cam means operatively carried by said carriage and arranged to be driven by said driving means, a cam follower fixedly mounted upon the machine frame and arranged to be engaged by said cam means for periodically raising the carriage to lift the upper run of the conveyor belt means above the floor of the hopper to engage and eject the lowermost object from said hopper each time the carriage is raised, and means manually operable for lifting and holding the carriage raised to maintain the upper run of the conveyor belt means above the floor of the hopper for continuously feeding objects therefrom.

3. In a conveyor mechanism for feeding objects from the feed hopper of an object treating machine, in combination, a carriage mounted below said hopper for movement relative to the machine frame, friction means mounted on said carriage and movable relative thereto, said friction means being disposed below said feed hopper and movable toward and away from said hopper, said friction means also being movable in a direction to feed objects from said hopper, a pulley, a belt for driving said pulley, and means forming a driving connection between said pulley and said carriage and friction means for positively moving said friction means into object engaging position and for driving said friction means in object feeding direction.

4. In a conveyor mechanism for feeding objects from the feed hopper of an object treating machine, in combination, a carriage mounted below said hopper for movement relative to the machine frame, friction means mounted on said carriage and movable relative thereto, said friction means being disposed below said feed hopper and movable toward and away from said hopper, said friction means also being movable in a direction to feed objects from said hopper, a pulley, a belt for driving said pulley, means forming a driving connection between said pulley and said carriage and friction means for positively moving said friction means into object engaging position and for driving said friction means in object feeding direction, said friction means being responsive to the force of gravity so as to fall away from its object engaging position after an object has been fed from said hopper.

5. In a conveyor mechanism for feeding objects from the feed hopper of an object treating machine, in combination, a table provided with slots, a hopper on said table, a carriage mounted below said table and underneath said hopper for movement toward and away from said table, friction treaded means mounted on said carriage and adapted to be moved thereby through said slots in said table to engage the under surface of the bottommost of a number of objects stacked in said hopper to feed it therefrom, means for moving said carriage toward and away from said table and means for driving said friction treaded means.

6. Apparatus according to claim 5 wherein means are provided for operating said driving means at different rates of speed.

7. Apparatus according to claim 5 wherein means are provided which are operable for lifting and holding said carriage in a position wherein said friction treaded means is maintained in a position of constant engagement relative to the position of the lowermost object of said hopper.

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