March 7, 1944. C. D. RYAN ET AL 2,343,479

ENVELOPE HOPPER AND STRIPPING MECHANISM FOR MAIL TREATING APPARATUS

Original Filed April 29, 1940 3 Sheets-Sheet 1

Fig. 2.

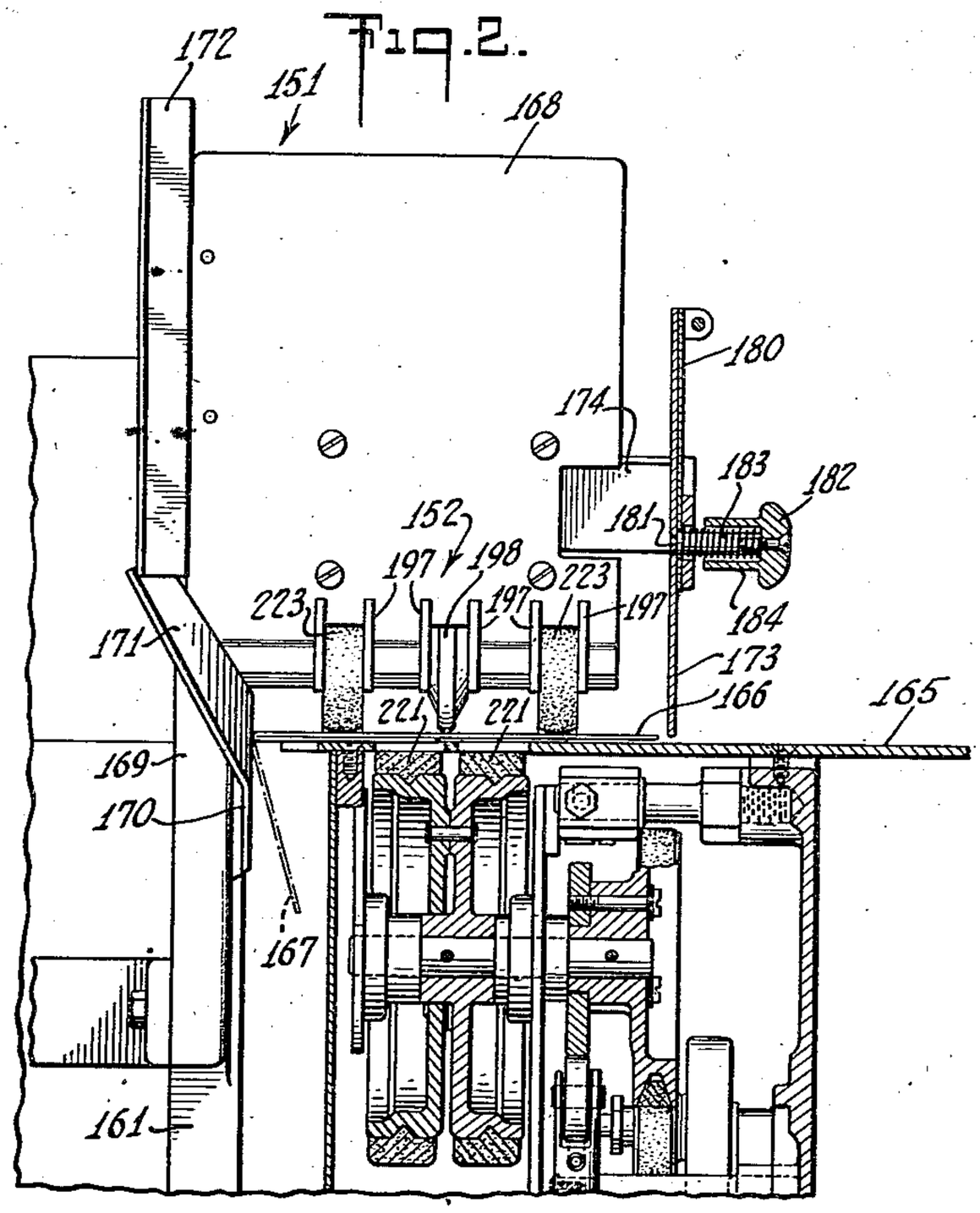
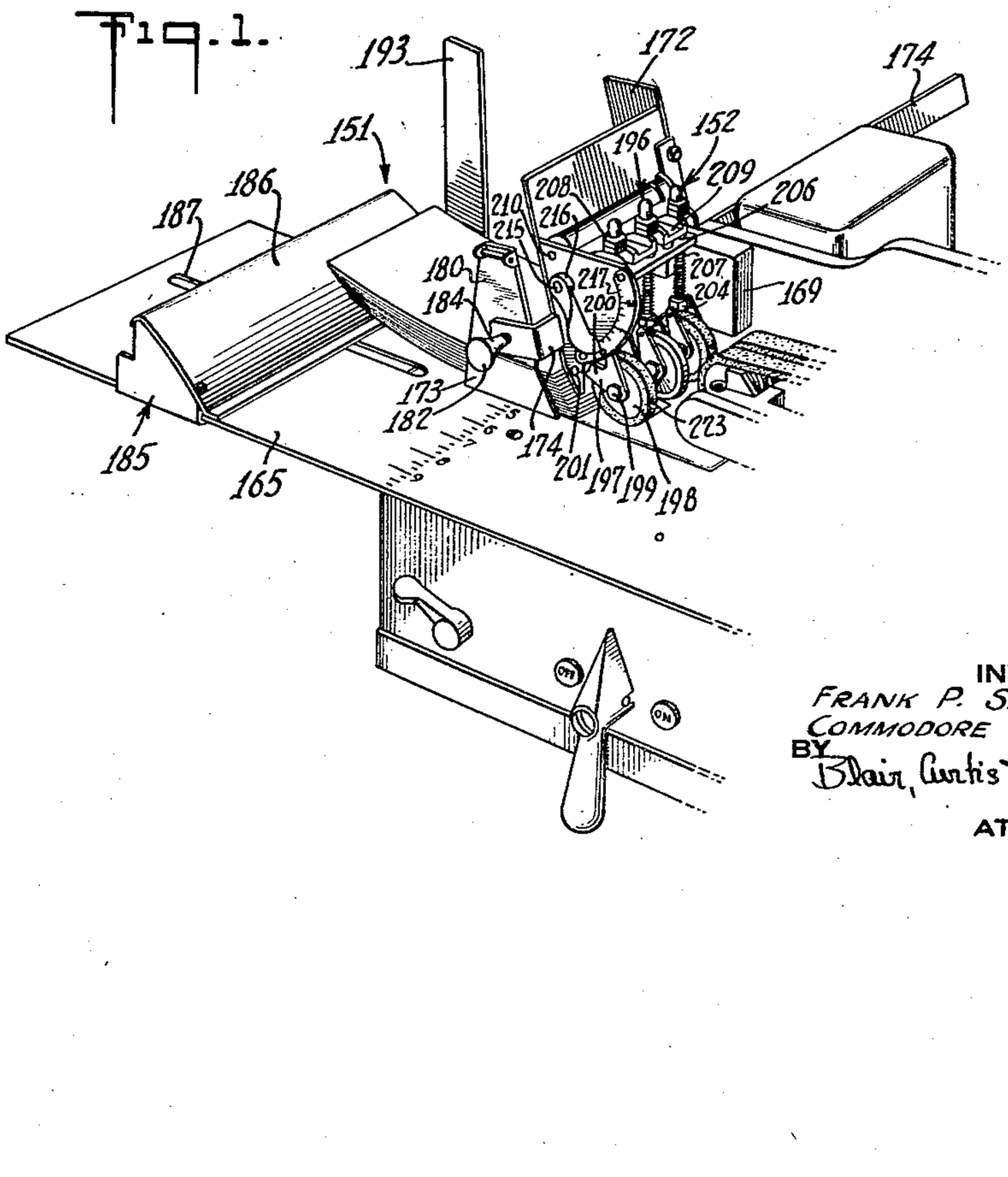


Fig. 1.



INVENTOR
FRANK P. SAGER
COMMODORE D. RYAN
BY Blair, Curtis & Hayward
ATTORNEYS

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FIG. 3.

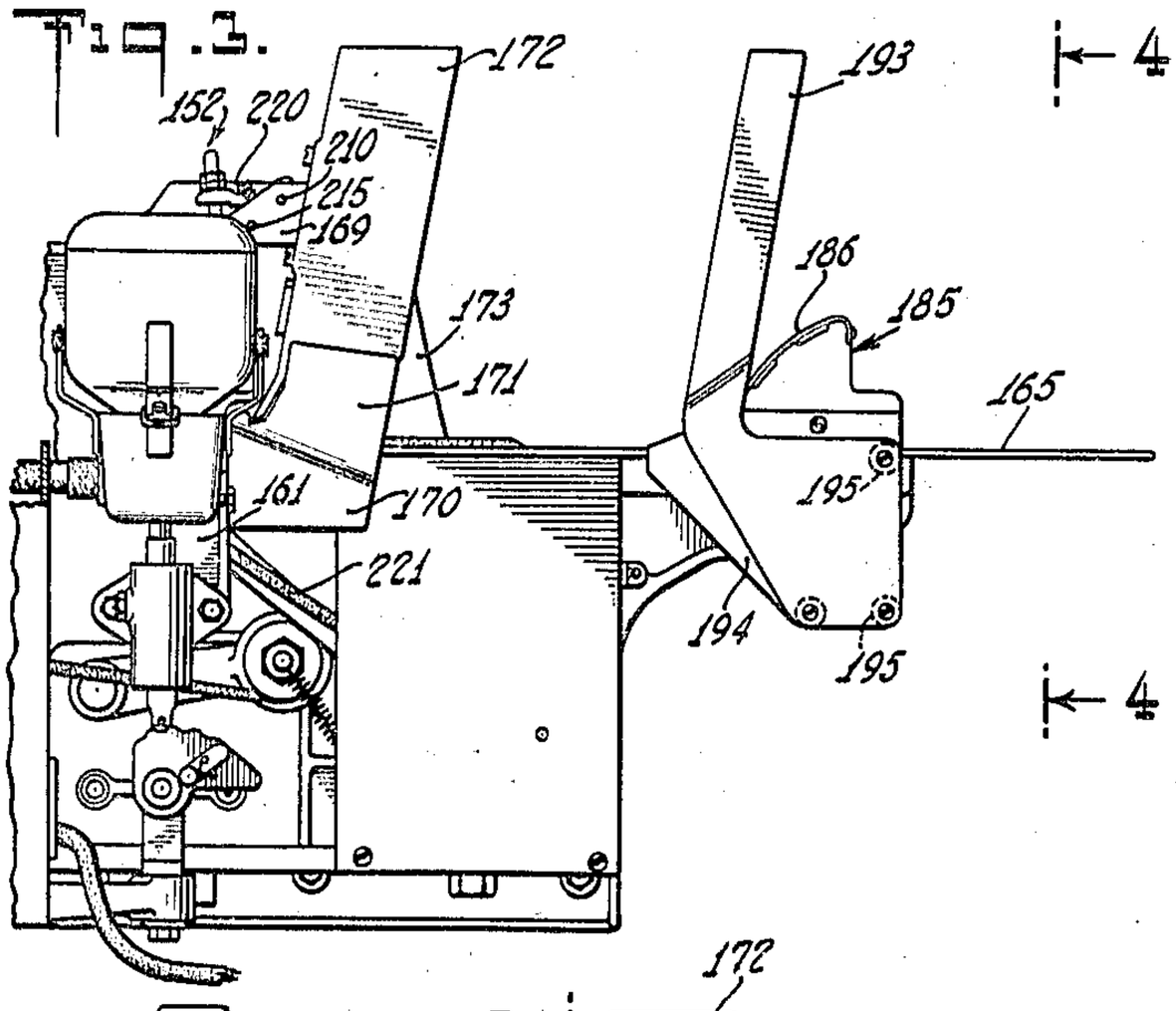


FIG. 4.

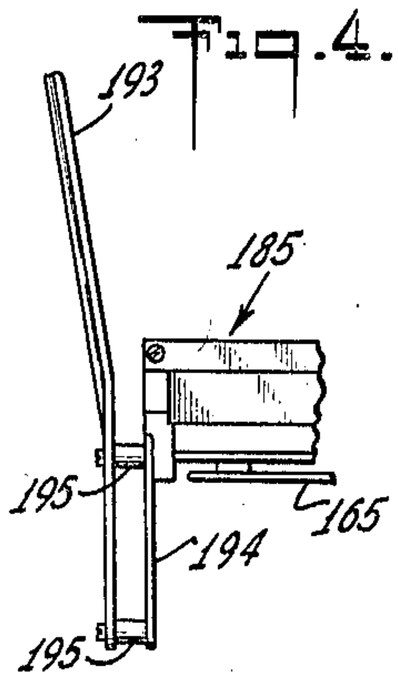
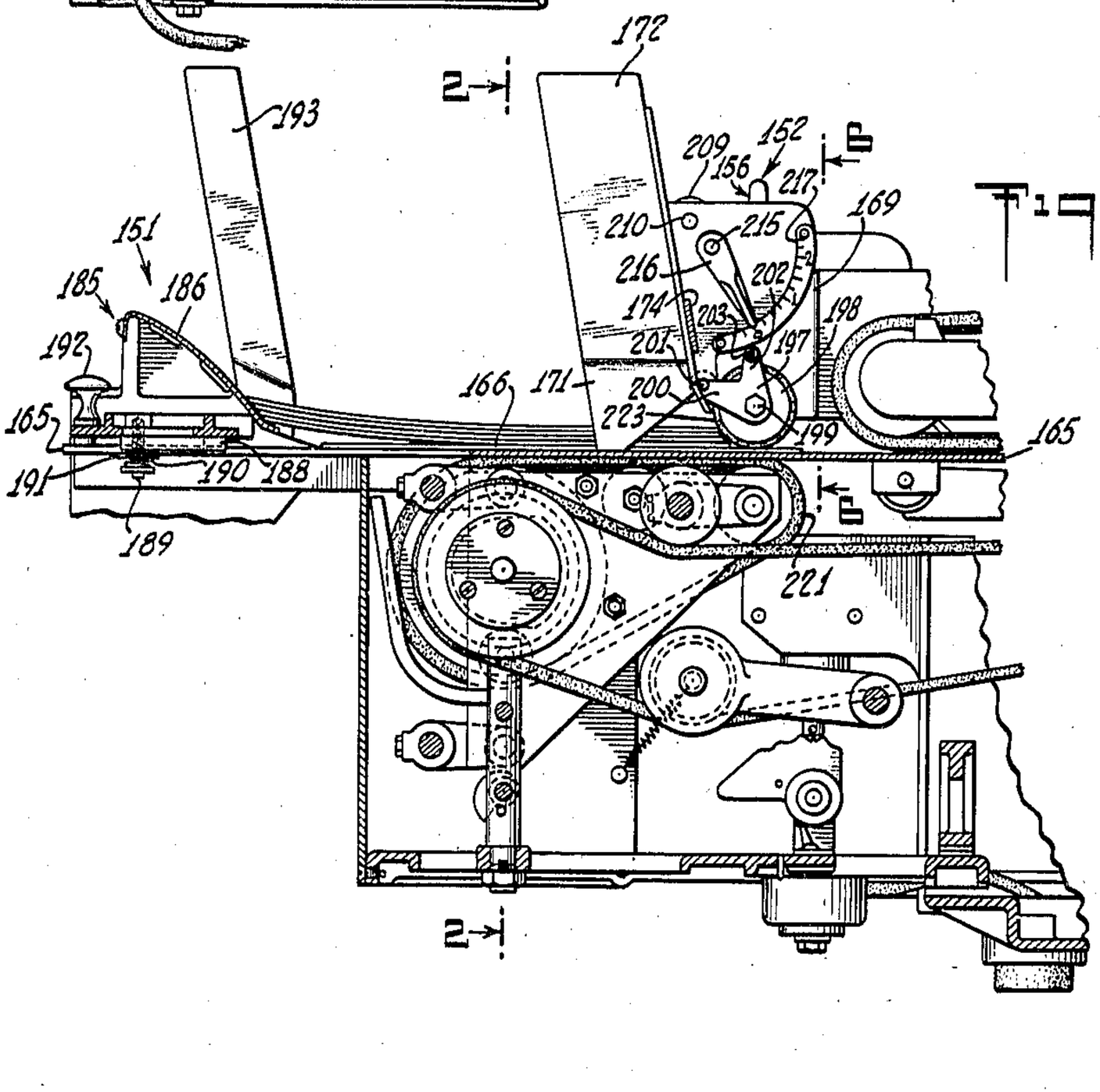


FIG. 5



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Original Filed April 29, 1940 3 Sheets-Sheet 3

Fig. 6.

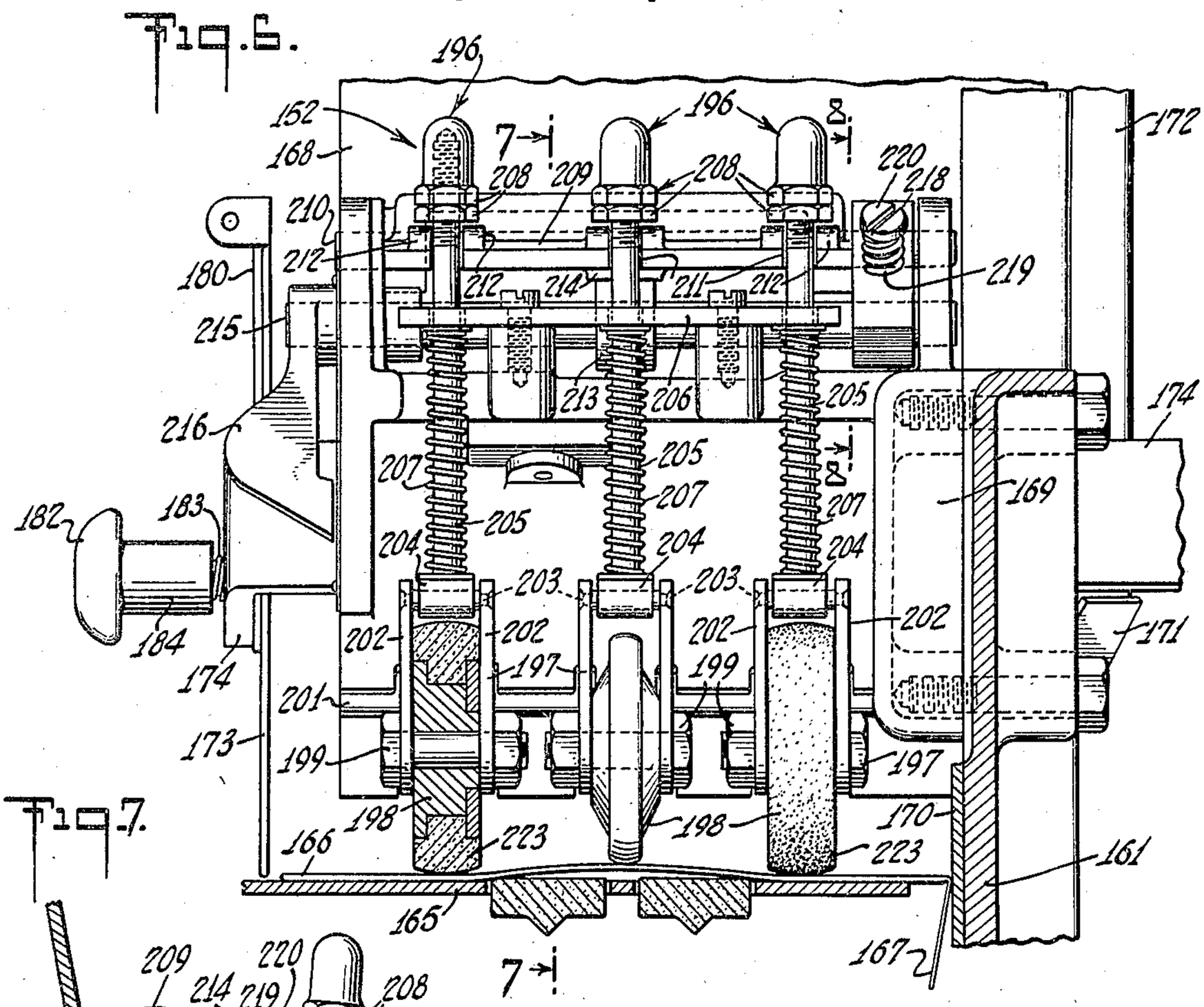


Fig. 7.

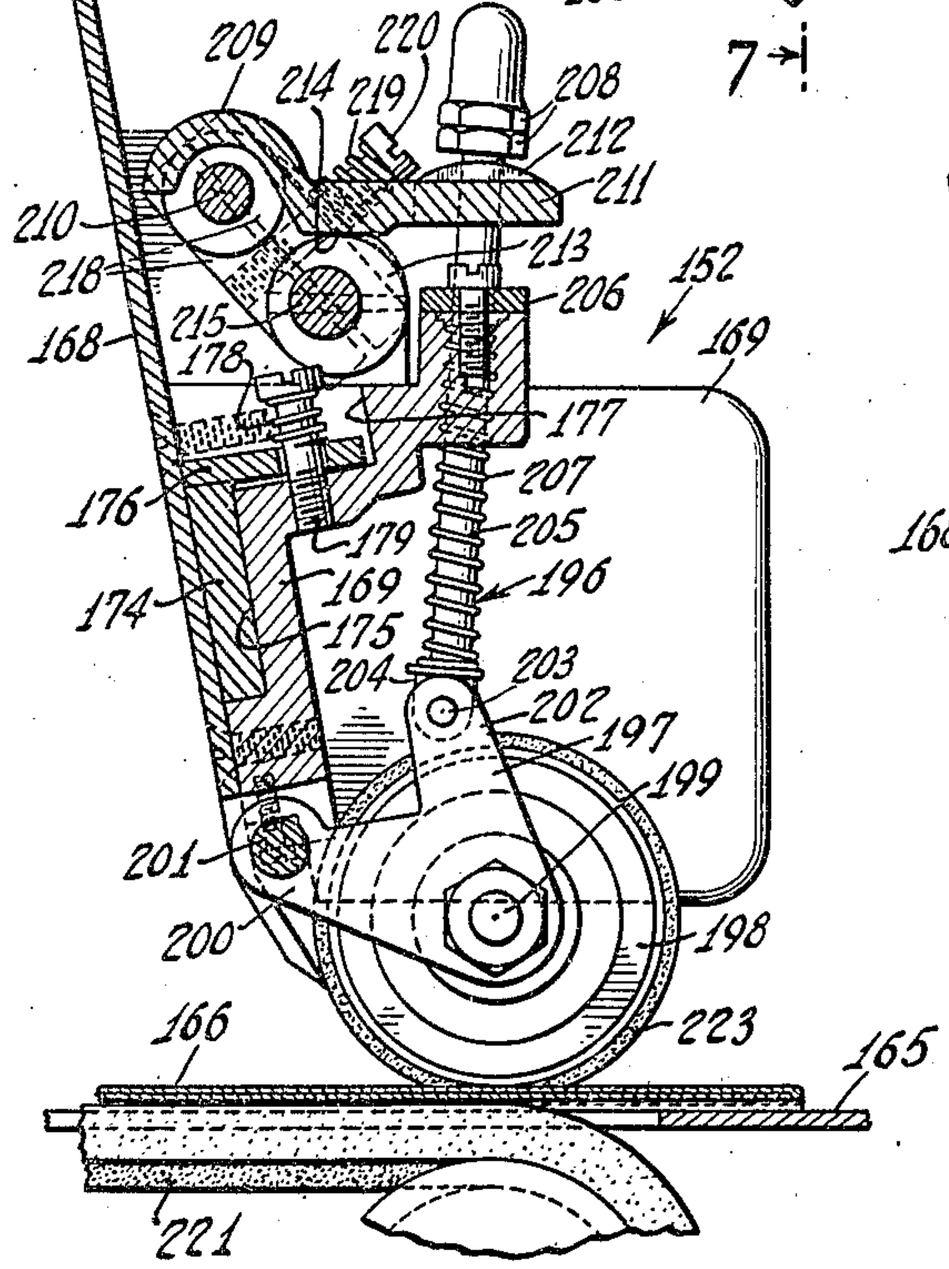
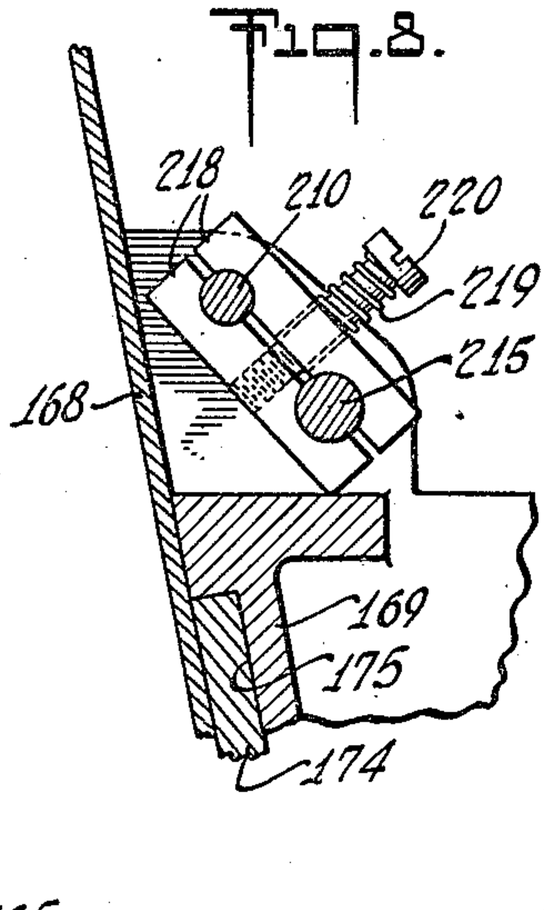


Fig. 8.



INVENTOR
FRANK P. SAGER.
COMMODORE D. RYAN.
BY
Blair, Curtis & Hayward.
ATTORNEYS

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UNITED STATES PATENT OFFICE

2,343,479

ENVELOPE HOPPER AND STRIPPING MECHANISM FOR MAIL TREATING APPARATUS

Commodore D. Ryan and Frank P. Sager, Los Angeles, Calif., assignors to National Postal Meter Company, Inc., Rochester, N. Y., a corporation of Delaware

Original application April 29, 1940, Serial No. 332,305. Divided and this application December 2, 1941, Serial No. 421,320

14 Claims. (Cl. 271—41)

This invention relates to improvements in a mail treating machine and more particularly to a feeding device including an envelope hopper and stripping unit for feeding mailing matter such as envelopes or post cards into the machine.

One of the objects of this invention is to provide an envelope hopper and stripping unit for a mail treating machine which is simple and inexpensive in construction and yet thoroughly durable under conditions of extended rigorous use. Another object is to provide apparatus of the above nature capable of accommodating a wide variety of envelope sizes and shapes as well as other types of mailing matter such as post cards. Another object is to provide an envelope feed hopper of the above nature in which either sealed envelopes or unsealed envelopes with their flaps depending therefrom may be stacked and fed into the machine. Other objects will be in part apparent and in part pointed out hereinafter.

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 drawing wherein is shown one embodiment of our invention:

Figure 1 is a fragmentary perspective view of the mail treating machine and showing the envelope feed hopper with a stack of envelopes therein;

Figure 2 is a fragmental sectional view taken substantially along the line 2—2 of Figure 5 and showing the leading end of the envelope hopper;

Figure 3 is a rear elevation of the machine shown in Figure 1;

Figure 4 is a fragmentary sectional view taken substantially along the line 4—4 of Figure 3;

Figure 5 is a fragmentary front view partially in section of the machine shown in Figure 1;

Figure 6 is an enlarged sectional elevation taken substantially along the line 6—6 of Figure 5;

Figure 7 is a sectional view taken substantially along the line 7—7 of Figure 6; and,

Figure 8 is a sectional view taken substantially along the line 8—8 of Figure 6.

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

The mail treating machine shown in Figure 1 is disclosed in its entirety in the copending application of Frank P. Sager, et al., Serial No. 332,305, filed April 29, 1940, of which this application is a division.

The feed hopper to be particularly described hereinabove mentioned is generally indicated at 151 and in general is so constructed as to permit its ready adjustment for the reception of a wide range of envelope sizes and shapes to be treated. The envelopes, sealed or unsealed, may be indiscriminately placed therein. For example, those envelopes to be sealed as well as stamped may be placed in the hopper with their flaps nested, i. e. with their flaps open and hanging down over the envelope conveyor table 165 as shown in Figure 8. The unsealed envelopes may be stacked in the hopper along with envelopes which have been sealed or with envelopes which may have had their flaps folded within their body portions. All of such envelopes are successively conveyed from the hopper and those requiring sealing will be passed through a moistening device while those not requiring sealing will pass over the moistening device and all in turn will be delivered to the postage printing device. In other words in using hopper 151, it is not necessary to segregate the sealed from the unsealed envelopes before placing them in the hopper.

Feed hopper 151 includes a front plate 168 secured to a suitable bracket 169 extending forwardly from the intermediate frame plate 161 of the machine above a conveyor table 165. The plate 168 of the hopper is inclined as shown in Figures 1 and 7 and its lower edge is spaced above the envelope conveyor table 165 in the manner shown in these figures.

A guide plate 170 extends from the hopper to the printing drum of the meter to guide the envelopes during their passage through the machine. This guide plate is clearly shown in Figures 2 and 5 and at its hopper end is angled rearwardly and upwardly as indicated at 171 in Figures 2 and 5 and acts to guide the envelopes successively into accurate transferring register with the front face of this plate as the stack of envelopes feeds down in the hopper and thereby insures the correct register of each envelope with the sealing and printing mechanisms of the machine.

In order to permit a relatively tall stack of envelopes to be placed in the hopper, its front plate 168 is provided with a flanged envelope retaining plate 172 which extends upwardly from the surface 171 and is flared slightly to the rear of the machine to facilitate rapid stacking of the envelopes into the hopper.

As previously pointed out, the feed hopper 151 may be adjusted to accommodate envelopes varying greatly in width and for this purpose its side plate 173 is made adjustable. To provide for the adjustability of side plate 173, it is carried upon the forward end of the slide bar 174, which bar is slidably mounted in channel 175 formed in frame bracket 169 and confined therein by the front hopper plate 168 (Figures 7 and 8). A fric-

tion means is provided for yieldingly maintaining the slide bar in any position of adjustment which means includes as illustrated in Figure 7, a friction plate 176 mounted in recess 177 formed in bracket 169 and yieldingly pressed against the upper edge of the slide bar 174 by means of spring 178 which encircles the retaining screw 179 and acts between the head of this screw and the plate. The side plate 173 is connected to the slide bar 174 to provide for a limited amount of movement between these two parts to provide the necessary clearance between the envelopes and side plate 173.

The adjustable side plate 173 at its upper end is hinged to the bracket plate 180 (Figure 2), which, in turn, is securely fastened to the slide bar 174. An adjusting pin 181 is fastened to plate 173 and passes freely through the bracket plate 180 and slide bar 174. Mounted upon the free end of pin 181 is knob 182. Surrounding pin 181 and acting between the bracket plate 180 and the inner surface of knob 182 is a spring 183 which acts to normally maintain the adjustable side plate 173 in contact with the bracket plate 180 as shown in Figure 2.

The knob 182 is provided with a shank 184 counterbored to receive spring 183 and the shank extends to within a distance from the slide bar 174 corresponding to the clearance necessary between the stack of envelopes and side plate 173 after the latter has been adjusted to suit the width of the envelopes stacked in said hopper.

With the device just described, it is an easy matter to adjust the side plate 173 to the proper setting for the width of envelopes to be treated and it automatically provides the necessary clearance between the envelopes and side plate. It is recommended that this adjustment be accomplished in the following manner: The side plate 173 should be first moved outwardly to a distance greater than the width of envelopes to be placed within the hopper, next the envelopes should be placed in the hopper and by pressing upon the knob 182, the spring 183 will be compressed until the shank 184 of the knob engages the slide bar 174 whereupon the bar and plate will be moved inwardly toward the stack of envelopes until the side plate 173 contacts said stack, at which point the knob 182 may be released and the spring 183 will thereupon act to withdraw the plate from the stack a distance corresponding to the space between shank 184 and bar 174 to provide the necessary clearance between the plate and envelopes.

As a further aid in adjusting plate 173, the top surface of the envelope conveyor table 165 is provided with a graduated scale representing the width of envelopes in inches (Figure 1). As an example of the manner in which the plate may be adjusted with respect to this scale, it will be assumed that envelopes 4 inches in width are to be treated and the plate is in position to treat envelopes of a narrower width, the first action will be to move the plate out beyond the 4-inch graduation and then to move the plate inwardly by pushing upon knob 182 until the bottom edge of the plate aligns with the 4-inch graduation and then upon release of the knob, it will automatically move outwardly to provide the necessary clearance in the manner previously described.

To insure an accurate feeding of the envelopes from the hopper, it is desirable to support the rear end of the envelope stack upon a raised inclined surface (Figures 1, 3, and 5). This feature maintains the lowermost envelopes in the stack in shingled relation, as shown in Figure 1, whereby as the envelopes feed down in the stack and engage this surface, they are urged to the right as viewed in Figure 1, until they engage the curved surfaces of the stripper discs. This not only starts a stripping action between the individual envelopes, but at the same time progressively feeds the envelopes into the stripper.

This mechanism includes a lift member 185 (Figures 1, 3, and 5) having an inclined surface 186. The lift member may be formed of a suitable casting and slidably mounted upon the left hand end of the envelope conveyor plate 165 for adjustment along said plate to suit the length of envelopes to be treated.

The lift member is maintained in alignment with the envelope conveyor plate 165 through a slot and key connection, which connection is shown in Figures 1 and 5 and includes providing the plate with a longitudinally extending slot 187 and the lift member with a key 188 slidably extending into said slot. Friction means are provided to yieldingly maintain the lift member at any position of adjustment and this friction means may include (Figure 5) a screw 189 extending downward from the lift member casting through the key and slot connection for supporting friction spring 190. The spring 190 acts between the head of screw 189 and a suitable friction disk 191 engaging the undersurface of plate 165. A knob 192 provides a convenient handle for moving the lift member along the plate 165. This structure permits a quick and easy adjustment of the feed hopper to suit envelopes of various lengths.

To maintain the rear ends of the envelopes stacked in the hopper from shifting out of the proper alignment, the lift member carries an envelope guide plate 193 supported from the lift member by bracket 194, spacers 195, and suitable screws (Figures 3 and 4). As may be observed in these figures, the guide plate is spaced from the lift member a distance sufficient to provide room for the nested flaps of the envelopes to hang down over the inner edge of the envelope conveyor plate 165. Referring particularly to Figure 4, it will be observed that the guide plate 193 is angled rearwardly which angle generally corresponds to the backward slope of a stack of envelopes placed in the hopper having their flaps nested. It also may be desirable to angle the guide plate 193 to correspond to the slope of the front hopper plate 168 as shown in Figures 3 and 5.

A feed hopper of the type described is easily and quickly adjustable to suit a wide range of envelope lengths, widths, and thicknesses and will function with a high degree of reliability.

The stripper mechanism generally indicated at 152 (Figure 1) comprises another important feature of the machine. It operates to prevent the feeding of more than one envelope or piece of mail matter from the hopper at any one time. As a further feature, the stripper is made adjustable so as to efficiently strip relative thick, as well as extremely thin light mail matter.

The stripper assembly includes three separate and individually operable stripping units 196 which may be substantially of the same construction. It is desirable, however, to provide the center stripper unit with a metallic stripper disc and to provide the other units with rubber tired stripper discs. Inasmuch as the stripper units are identical in construction, excepting for the difference in the stripper discs as above pointed

out, the same reference numbers will be used for the corresponding parts, and the description of one will suffice for all.

Each stripper unit 196 may include a pair of spaced brackets 197, having a stripper disc 198 clamped rigidly therebetween by means of bolt 199. The brackets 197 are provided with arms 200 which arms extend to the left as viewed in Figure 7 and are pivotally mounted on pin 201 suitably mounted on the bracket 169 (Figures 6 and 7). The brackets 197 are provided with upwardly directed extensions 202 which extensions are hingedly connected as at 203 to a head 204 of an upwardly extending rod 205 which rod in turn projects through a plate 206 mounted on bracket 169. Interposed between the head 204 and plate 206 is a compressed spring 207 which normally urges the disc 198 downwardly. The upper end of rod 205 is provided with adjustable stop nuts 208. A height regulating bracket 209 is hinged to the bracket 169 by pin 210. The said bracket 209 extends horizontally to the right as viewed in Figure 7 and is provided with bifurcations 211 to straddle the upper end of the rods 205 below the stop nuts 208. Arcuate pads 212 are provided at the sides of the bifurcations 211 to engage the underside of the lower stop nut 208.

The height regulating bracket 209 is adjusted by means of an eccentric cam 213 which cooperates with a boss 214 on the underside of said bracket 209. The eccentric cam 213 is pinned on shaft 215 which shaft is journaled at its ends in bracket 169. The forward end of shaft 215 projects beyond bracket 169 and has attached thereto a handle 216 which handle also acts as a pointer for an arcuate dial 217, fastened to the front face of bracket 169 (Figure 1). The dial 217 is provided with calibrations to indicate the setting for stripper discs to a proper adjustment for the thickness of mail to be treated.

To yieldingly maintain the eccentric shaft 215 in the set position, a friction clamp is provided which includes a pair of jaws 218 recessed as shown in Figure 8 to straddle hinge pin 210 and eccentric shaft 215. The jaws 218 are yieldingly urged into pinching engagement with eccentric shaft 215 by compression spring 219 interposed between the head of a tension adjusting screw 220 and the upper of the two jaws 218. The adjusting screw 220 passes freely through a hole in the upper jaw 218 and is threaded into the lower jaw as shown in Figure 8.

It will be seen upon inspection of Figure 6 that the stripper units 196 are separated so that feed belts 221 are positioned between the discs 198. It will also be seen that the center disc 198 is metallic and the discs at the sides are provided with rubber tires 223.

The rubber tired discs 198 yieldingly hold down the bottom envelope 166 of the stack against the table 165 and hold back the remaining envelopes in the stack during the metering operation. The center metallic stripper disc 198 holds down the bottom envelope against the feed belts 221, thus providing the frictional contact with feed belts 221 for stripping the bottom envelope from the stack. The frictional contact of envelope with feed belts 221 is adjusted by setting the stop nuts 208.

All three of the stripper discs 198 are adjustable in unison to operate upon the thickness of mail matter to be treated by manipulation of handle 216 to raise or lower the stripper discs to suit the thickness of the particular mail matter to be treated.

The stripper discs 198 are securely clamped between brackets 197 to hold said discs against rotation during the stripping and feeding of mail matter from the hopper. However, when the discs have become worn, and particularly the rubber tired discs, they may be turned to present a new surface for engagement with the mail matter.

Thus stripper units 196 cooperate with feeding belt 291 which is a part of a metering mechanism, the details of construction and operation of which are fully set forth in the copending application of Commodore D. Ryan, Serial No. 421,321, filed December 2, 1941, which copending application is also a division of the above-noted Sager, et al. application.

It may now be seen that we have provided an envelope hopper and stripping mechanism which attains in a thoroughly efficient and practical manner the several objects set forth hereinabove.

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.

We claim:

1. In a stripping mechanism for the feed hopper of an object treating machine, a pair of spaced non-rotative rubber-tired stripping rollers, means mounting each of said rollers for independent movement, a single control means for limiting the movement of said rollers in their direction of contact without affecting the independent upward movement of said rollers when engaged by an object, and an independent spring means for each roller arranged to independently resist the upward movement of each of said rollers.

2. In a stripping mechanism for the feed hopper of an object treating machine; a pair of spaced non-rotative rubber-tired stripping rollers, means mounting each of said rollers for independent movement, a single control means operable for selecting the plane of contact of said rollers with respect to the objects without affecting the independent upward movement of said rollers when engaged and lifted by said objects, means for indicating the setting of said control means and an independent spring means for each roller arranged to resist the upward lifting movement of their respective rollers.

3. In a stripping mechanism for the feed hopper of an object treating machine; a pair of spaced non-rotative rubber-tired stripping rollers, a metal-treaded stripping roller positioned between said rubber-tired rollers, means mounting each of said rollers for independent movement, a single control mechanism operable for simultaneously adjusting all of said rollers with respect to the objects without affecting the independent upward movement of said rollers when engaged and lifted by said objects, and a separate spring means acting between each of the roller mounting means and the frame of the machine for resisting the upward lifting movement of said rollers.

4. In a stripping mechanism for the feed hopper of an object treating machine, a pair of spaced non-rotative friction treaded stripping rollers, and a non-friction treaded stripping member positioned between the pair of said rollers and having its envelope engaging surface

arranged to be engaged by the center portion of the envelopes at the time of their engagement with said rollers but at a higher level.

5. In a stripping mechanism for the feed hopper of an object treating machine, a pair of spaced friction-treaded stripper members, and a non-friction pressure member positioned between and slightly above said friction stripper members.

6. In a stripping mechanism for the feed hopper of an object treating machine, a pair of spaced non-rotative rubber-tired stripping rollers, means mounting each of said rollers for independent movement, a single control means for limiting the movement of said rollers in their direction of contact without affecting the independent upward movement of said rollers when engaged by an object, and an independent spring means for each roller arranged to independently resist the upward movement of each of said rollers.

7. In a stripping mechanism for the feed hopper of an object treating machine; a pair of spaced non-rotative rubber-tired stripping rollers, a metal treaded stripping member positioned between said rubber-tired rollers, means mounting each of said rollers and said member for independent movement, a single control mechanism operable for simultaneously adjusting all of said rollers and said member with respect to the objects without affecting the independent upward movement of said rollers and said member when engaged and lifted by said objects, and a separate spring means acting between each of the roller and member mounting means and the frame of the machine for resisting the upward lifting movement of said rollers and said member.

8. In a stripping mechanism for the feed hopper of an object treating machine, a pair of spaced non-rotative rubber tired stripping rollers, means mounting each of said rollers for independent movement, a single control means for limiting the movement of said rollers in their direction of contact without affecting the independent upward movement of said rollers when engaged by an object, and an independent spring means for each roller arranged to independently resist the upward movement of each of said rollers.

9. In a stripping mechanism for the feed hopper of an object treating machine; a pair of spaced non-rotative rubber-tired stripping rollers, means mounting each of said rollers for independent movement, a single control means operable for selecting the plane of contact of said rollers with respect to the objects without affecting the independent upward movement of said rollers when engaged and lifted by said objects, means for indicating the setting of said control means and an independent spring means for each roller arranged to resist the upward lifting movement of their respective rollers.

10. An envelope feeding device for a mail treating machine or the like comprising in combination, a table adapted to support a stack of envelopes, a guide plate extending upwardly from said table for guiding the leading edges of said envelopes, said guide plate being inclined opposite to the direction of travel of said envelopes so that when said envelopes are held against said guide plate, they are arranged in shingled relationship, a second guide plate extending upwardly from said table, said second guide plate being inclined in the same general direction as said first guide plate to engage the trailing edges of said envelopes and with said first guide plate hold them in shingled relationship, and means forming a shelf adjacent the lower edge of said second guide plate for supporting the weight of the stack of envelopes to keep the weight thereof off the bottommost envelope when it lies flat on the table in a position to be fed therefrom.

11. An envelope feeding device for a mail treating machine or the like comprising in combination, a table adapted to support a stack of envelopes, a hopper on said table for said envelopes including an inclined plate for inclining the stack of envelopes rearwardly of their path of travel when fed from said hopper over said plate whereby the envelopes in said stack are maintained in shingled relationship, an envelope feeding device extending upwardly through said table for engaging the bottommost envelope of the stack and feeding it from said hopper, and a stripping mechanism coacting with said feeding device for feeding but one envelope at a time from said hopper.

12. In a stripping mechanism, in combination, a bracket, a friction treaded stripping member secured to said bracket, a support, means pivotally mounting said bracket on said support, spring means associated with said bracket and said support for forcing said stripping member in a direction to engage the article to be operated on, and cam means associated with said support and said bracket and selectively operable to force said bracket and said stripping member in a direction diverse from the direction of bias of said spring means to set said stripping member in a desired position.

13. In a stripping mechanism, in combination, a bracket, a friction treaded stripping member secured to said bracket, a support, means pivotally mounting said bracket on said support, spring means associated with said bracket and said support for forcing said stripping member in a direction to engage the article to be operated on, cam means associated with said support and said bracket and selectively operable to force said bracket and said stripping member in a direction diverse from the direction of bias of said spring means to set said stripping member in a desired position, and means for indicating the set position of said stripping member.

14. In a stripping device for separating the lowermost letter from a stack of letters, in combination, a support, a bracket pivotally connected to said support, a stripping member non-rotatively secured to said bracket whereby said stripping member is movable toward and away from a letter adapted to be engaged thereby, a link connected to said bracket and extending upwardly therefrom, an arm pivotally connected to the upper end of said link and to said support, a shaft rotatably mounted on said support, means including a cam disposed between said shaft and said arm and operable upon rotation of said shaft to pivot said arm whereby said link and accordingly said bracket and stripping member are moved in one direction or another depending on the direction of rotation of said shaft, means for manually rotating said shaft to selectively position said stripping member at a desired elevation, and spring means for biasing said stripping member downwardly independently of the setting of manually rotatable means.

COMMODORE D. RYAN.
FRANK P. SAGER.