

No. 753,256.

PATENTED MAR. 1, 1904.

S. A. GRANT.
ENVELOP MACHINE.

APPLICATION FILED MAY 23, 1903.

NO MODEL.

7 SHEETS—SHEET 1.

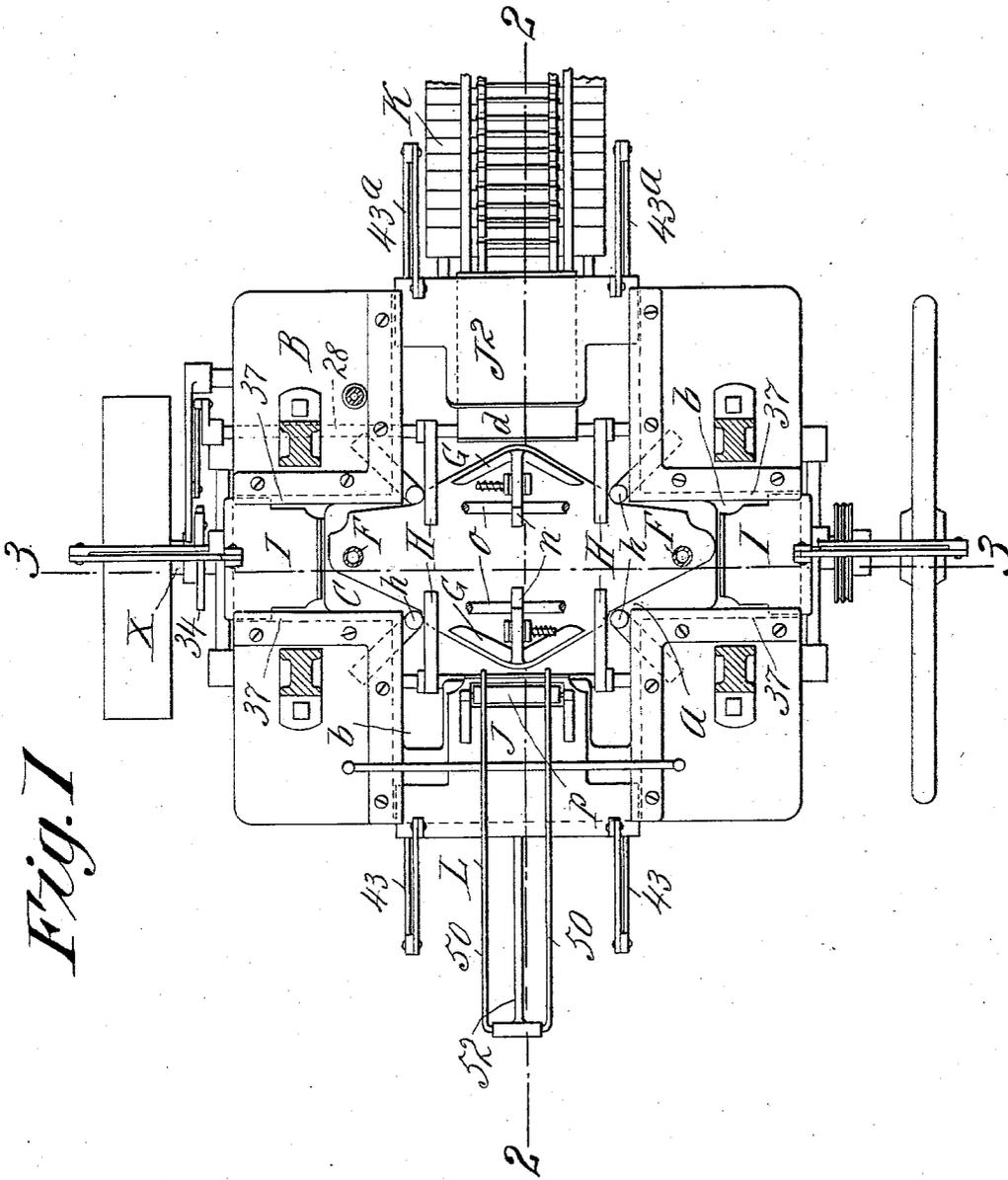


Fig. 1

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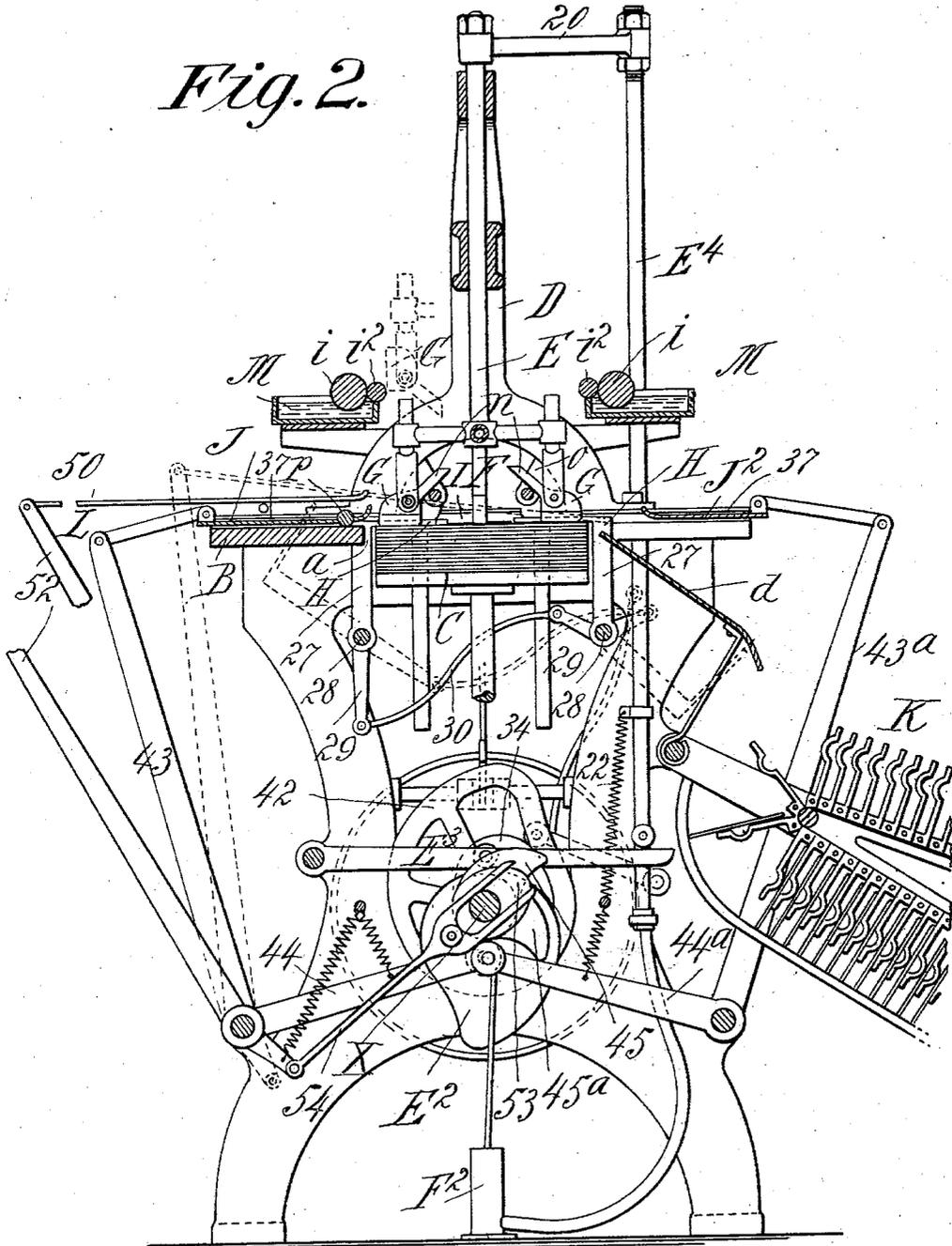
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7 SHEETS—SHEET 2.

Fig. 2.



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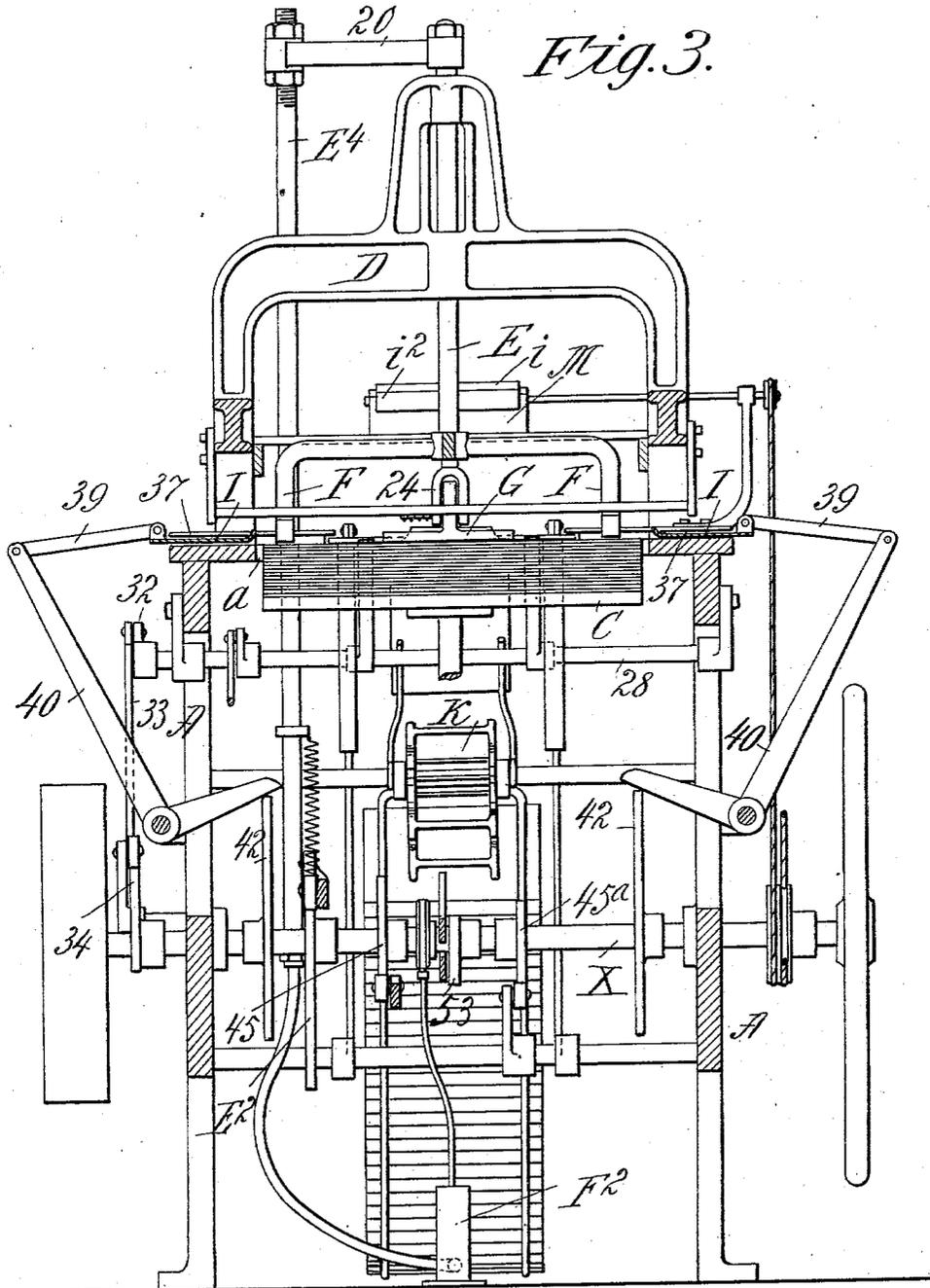
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7 SHEETS—SHEET 3.



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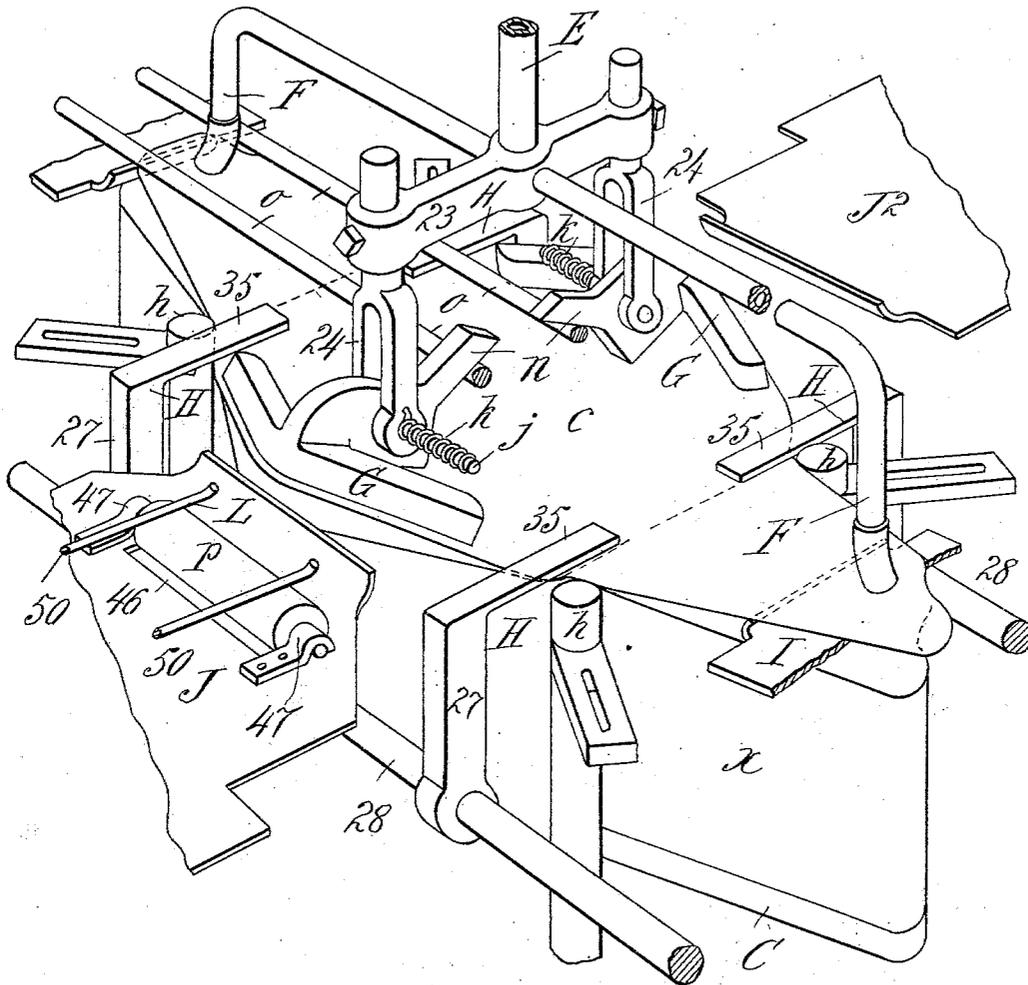
PATENTED MAR. 1, 1904.

S. A. GRANT.
ENVELOP MACHINE.
APPLICATION FILED MAY 28, 1903.

NO MODEL.

7 SHEETS—SHEET 4.

Fig. 4.



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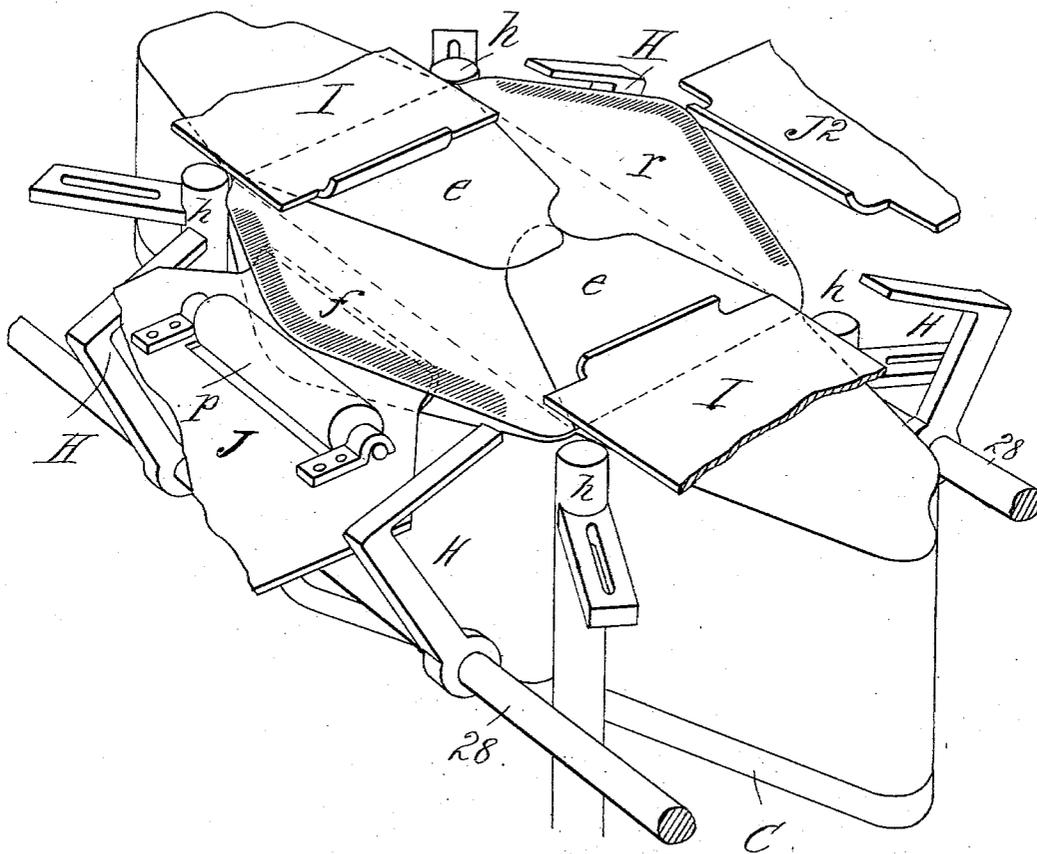
PATENTED MAR. 1, 1904.

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7 SHEETS—SHEET 5.

Fig. 5.



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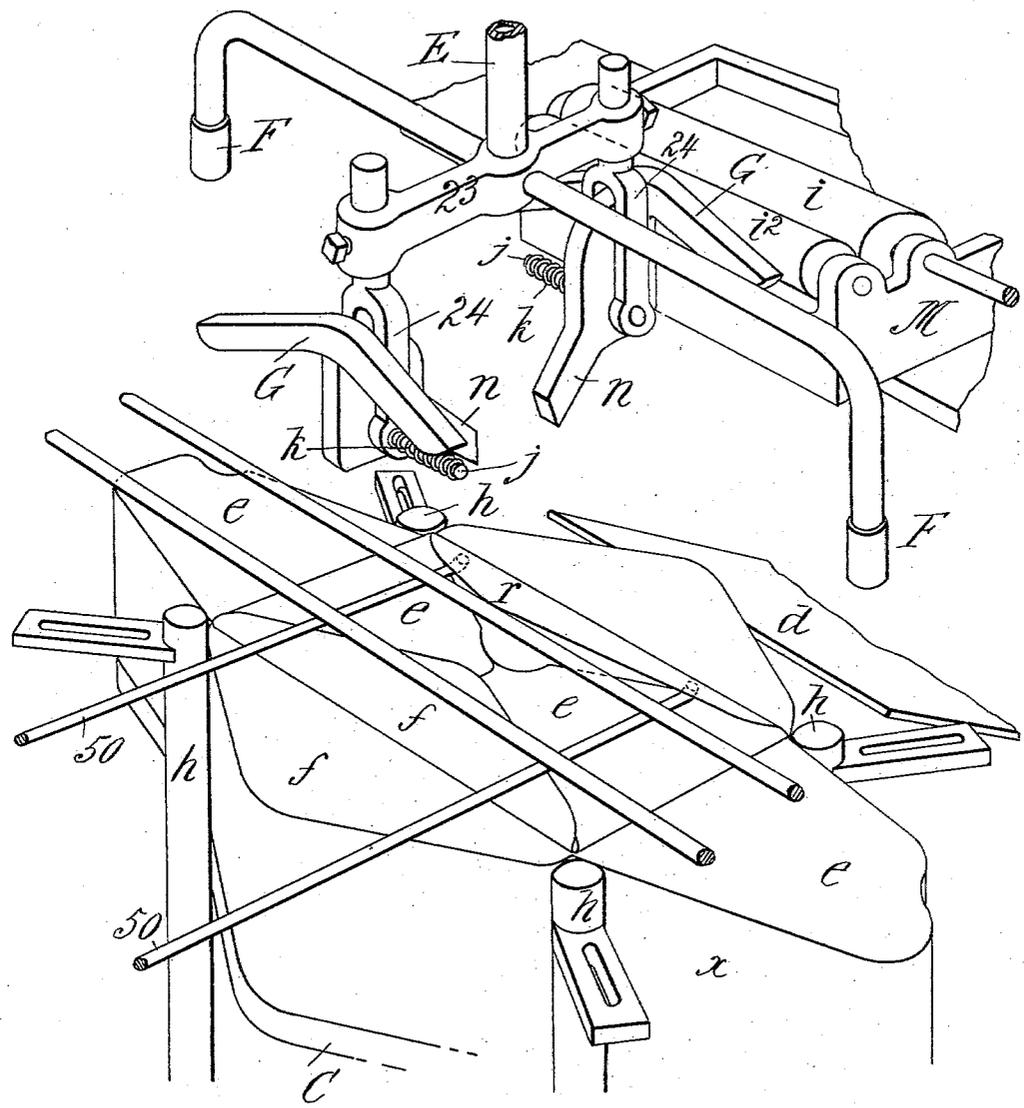
PATENTED MAR. 1, 1904.

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7 SHEETS—SHEET 6.

Fig. 6.



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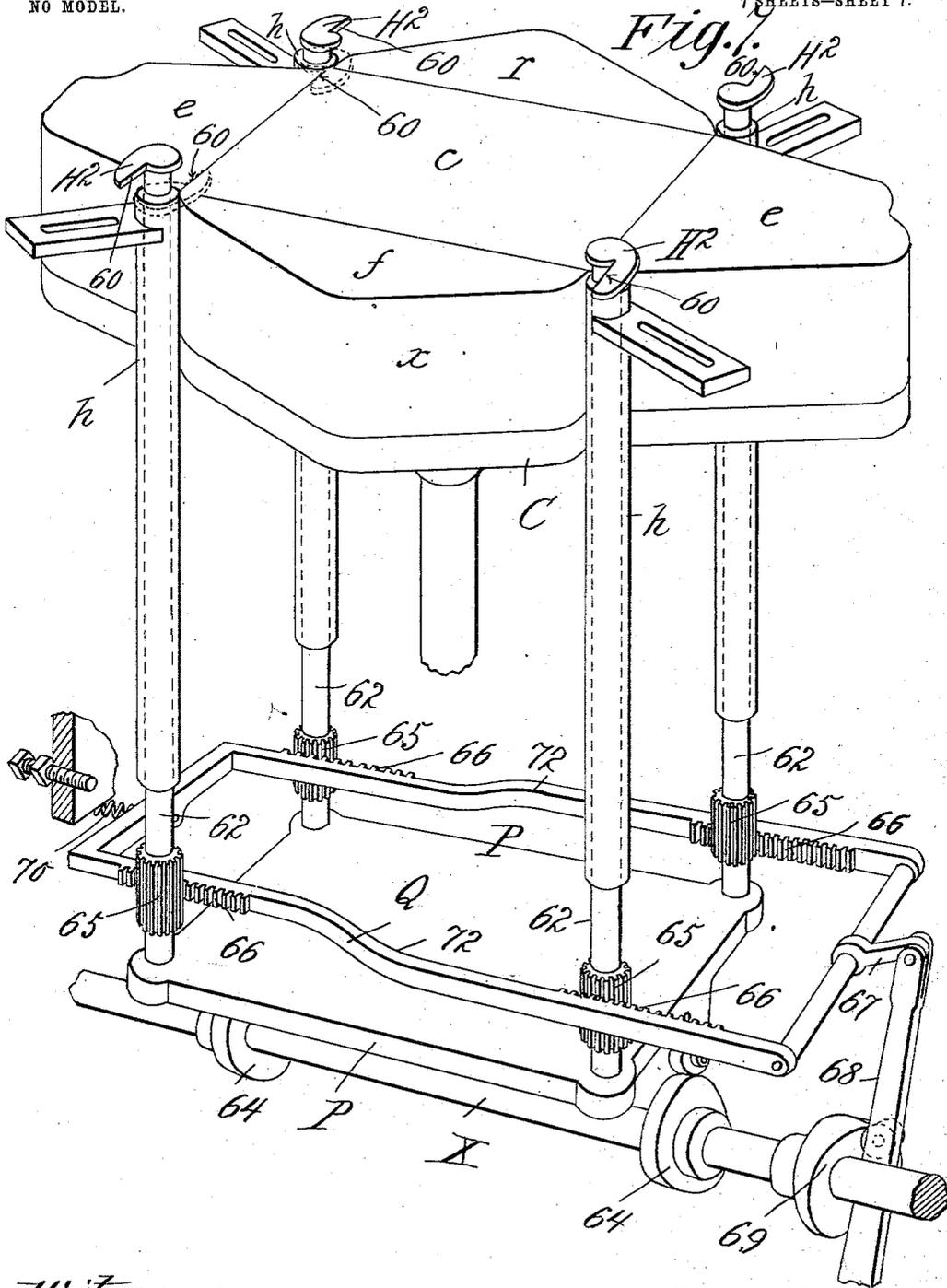
PATENTED MAR. 1, 1904.

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APPLICATION FILED MAY 23, 1903.

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7 SHEETS—SHEET 7.



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UNITED STATES PATENT OFFICE.

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ENVELOP-MACHINE.

SPECIFICATION forming part of Letters Patent No. 753,256, dated March 1, 1904.

Application filed May 23, 1903. Serial No. 158,422. (No model.)

To all whom it may concern:

Be it known that I, SIDNEY A. GRANT, a citizen of the United States of America, and a resident of Springfield, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Envelop-Machines, of which the following is a full, clear, and exact description.

This invention relates to improvements in envelop-machines; and the object thereof is to produce a machine for making envelops of the most common kind with the utmost rapidity and by a less number of operations and manipulations of the blank than has heretofore been required.

In the present machine the blanks are provided in a pile on an automatic elevator of the ordinary construction, and without being removed from the pile the uppermost blank is gummed at its front and rear flaps, the end flaps are folded over on the middle portion of the blank, the gummed rear flap is folded over and stuck to the end flaps, the sealing-flap is overturned and creased, but left as usual unstuck, and the envelop is pushed off the pile at which it was made into the drier. It therefore becomes apparent that a machine having the capabilities for making the envelops, as above briefly outlined, dispenses with the creasing-box, reciprocating plunger, folding-wings, trap-door, and devices and equipments incidental thereto, as well also as the conveyer, commonly present in envelop-machines for transferring the gummed blank from its position at the top of the pile to its position at the creasing and folding mechanism, and therefore considerable time is saved in the operations for making each envelop, especially because of the fact that the pickers and gummers contribute in the folding operations.

The invention consists in entirely new organizations or coöperative arrangements of devices and in certain of the individual devices, all substantially as hereinafter fully described, and set forth in the claims.

An envelop-machine embodying mechanisms in accordance with the present invention is illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of the machine, the supporting-arch over the blank pile being shown in horizontal section, some of the higher parts consequently being absent. Fig. 2 is a sectional view from front to rear of the machine, as taken on the line 2 2, Fig. 1. Fig. 3 is a sectional elevation at right angles to Fig. 2 and as seen substantially beyond the plane indicated by line 3 3, Fig. 1. Fig. 4 is a perspective view showing the blank pile, the blank-retainers, the pneumatic end-flap pickers, the front and rear flap gummers, and the operating portions of the flap overturning or folding devices, the parts being represented in their relative positions at the beginning of the envelop-making operation. Fig. 5 is a view somewhat similar to Fig. 4, the gummers and pickers; however, being omitted, and illustrating the manner of folding the end flaps. Fig. 6 is a perspective view similar to Fig. 4, but showing the completed envelop in readiness to be pushed directly from the pile into the drier, the gummers being shown as located in their positions for receiving gum from the gum-supplying rolls therefor. Fig. 7 is a perspective representation of a modified form of mechanism for the retention of the middle portion of the top blank on the pile during the folding operations on the end flaps.

Similar characters of reference indicate corresponding parts in all of the views.

In the drawings, A represents the frame of the machine, comprising the table B, having about centrally thereof the aperture *a*, with aperture wings or openings *b* extending therefrom both forwardly and rearwardly and also toward the opposite ends of the machine, the blank-pile support C being located within or below said aperture, the same being understood as in the form of a platform comprised as the upper part of the "elevator," said elevator being of any of the well-known and common constructions of such mechanism automatically operable to gradually rise to maintain the top blank of the pile always at approximately the same level, the type of elevator employed being a matter of selection and involving no invention herein.

Above the blank-pile support is an arch D,

in which plays a vertical plunger-shaft E, carrying on suitable horizontal extensions the depending pneumatic end-flap pickers F F and the front and rear flap gummers G G.

5 e indicates the pile of blanks, of which $e e$ represent the end flaps, f the front flap, and r the rear flap, the terms "front" and "rear" being used in the sense of the location of these flaps in the pile as the machine is used—that is, the front flap f is the one located at the front of the machine, while what is herein termed the "rear" flap r is the sealing-flap, which, as envelops are manufactured, is left unstuck.

15 H H represent retainers operable to bear temporarily on the top blank of the pile to hold the same against displacement while the end-flap folders I I are folding the end flaps $e e$ over on the middle central portion c , they thereafter having movements of disengagement on the top of the pile, so as not to interfere with the actions of the front and rear folders J and J'.

25 K represents the drier-chain, which may be of any of the well-known specific constructions; but it has its location comparatively close to the blank-pile support and at the rear thereof, so that the envelops completed while remaining in the original position of the blank on the pile may by the pusher or ejector device L be discharged into the chain, d indicating an inclined guide-plate for directing the course of the envelops into the drier-chain.

30 $h h$ represent the usual vertical gage-posts for keeping the edges of the pile of the approximately diamond-shaped blanks even, the tops of these posts being about level with the normal top of the pile.

40 M represents gum-boxes, supported on brackets at the front and rear of the arch, the same having gum-rolls $i i'$ therein, each roll i' having its location so that its periphery will overhang the inner vertical side of the box, as shown in Fig. 2.

45 The vertical reciprocatory movements of the plunger-shaft E for correspondingly moving the pneumatic pickers F F and the gummers G G are imparted through means of the cam E², the cam-lever E³, the thrust-rod E⁴, connected by the horizontal bar 20 at the top to the plunger-shaft and the retracting-spring 22. The thrust-rod E⁴, bar 20, plunger E, and the extensions therefrom at the bottom, which carry the tubular pneumatic pickers, may be all constructed hollow, constituting conduits for suction between the pneumatic pickers and the suction-pump F⁵, no novelty residing in the pneumatic pickers and the means for imparting the suction effects therein, as broadly considered.

60 The gummers G at the front and rear of the bottom portion of the horizontal bracket 23 at the lower end of the plunger-shaft E are pivotally mounted in vertically-adjustable

depending yokes or forks 24, whereby they may be swung from positions with their lower gumming-faces horizontally, as required, at the time of impact against the top blank of the pile to positions with their gumming-faces 70 vertical, which positions they have when the plunger-shaft is elevated to bring the then vertical faces into gum-receiving passing-contact on the peripheries of the gumming-rollers i' therefor, as represented in Fig. 6. The 75 said gummers have horizontal pivot-studs j affixed thereto and extending loosely through the horizontally-perforated fork of the depending yoke 24, and a spiral spring k encircles the stud j , one end thereof being affixed to the stud and the other to the fork-leg, and all in such a manner that the torsional action of the spring is effective to carry and maintain the gummer with its face vertical. The said gummers G have upwardly 85 and inwardly inclined lever-arms n , and intersecting the vertical paths of movement of these arms are rigid stationary suitably-supported horizontal bars $o o$, down onto which the said lever-arms n are brought to contact 90 as the gummers in their downward bodily movements approach the pile, with the effect to swing the gummers, with their gumming-faces, into horizontal planes, as manifestly proper for gumming the front and rear flaps 95 of the blank.

The retainers H, as shown in Figs. 1, 2, 3, and 4 are represented as angular upper extensions of levers 27 on rock-shafts 28, having secondary arms 29 united by a link 30, 100 and one of the rock-shafts 28 has a lever extension 32, with which a thrust-rod 33 is connected, the thrust-rod being operated by cam 34 on the main shaft X of the machine. The upper fingers or members 35 of the retainers 105 H are periodically swung to bearing on the top of the intermediate portion c of the blank and retreat forwardly and rearwardly therefrom.

The end-flap folders I I are shown as in the 110 form of horizontal plates having their inner ends slightly upturned, said plates being guided for in and out reciprocatory movements in suitable ways 37 therefor at the margins of the wing-like or outwardly-extending 115 extensions b of the central aperture a in the table. The said end-flap folders are by links 39 respectively connected to angular levers 40, relatively to which the cams 42 operate, these cam-actuating mechanisms being timed, 120 so that one flap will be folded over slightly in advance of the other, and the retainer-fingers 33 have straight edged portions which serve as former-gages, over which the folding and creasing by the end-flap folders are performed, 125 and whereby the sharply-defined ends of the completed envelops will be assured.

The front-flap folder J, having the form of a flat plate with a narrowed inner extremity, is marginally guided on slideways in the ap- 130

ertures b in the table-top and which extend from front to rear of the machine, this plate having an inner upturned end, and it is linked at its outer portion to a lever-arm 43, which has connected thereto a cam-lever 44, coaxing with which is a cam 45 on the main shaft, and the rear-flap folder J^2 is by cam 45^a and lever connections 44^a reciprocated, the timing of the motions being such that the front-flap folder will operate a little earlier than the rear-flap folder. The horizontal reciprocatory plate constituting the front-flap folder has an aperture 46 through it near its inner end, adjacent and depending through which is mounted a roller p , the axis of which is at right angles to the line of movement of the folder-plate J , on which it is journaled, as indicated in Fig. 4. The clips or journal members 47, under which the end gudgeons of the roller p are engaged, may be of spring metal, whereby the roller will have a degree of yielding movement in its upward direction against the spring resistance imposed thereto, so that when the front-flap folder has its inward movement imparted thereto to overturn the front flap the roller p will operate to downwardly press the gummed portion of the flap to cause such portion to adhere with unusual certainty to the end flaps thereunder.

The envelop-discharging device L , as shown, is composed of a pair of straight rods 50 50, resembling a long bail having their lengths corresponding to the line of movement of the front-flap folder and being pivotally hung at the front end of the machine to the upper end of the lever 52, operated by cam 53 and thrust-rod 54. The extensions of the said rods 50 50 are such that under rearward movements they will engage in under the rear flap and at the junction thereof with the central portions c of the envelop, and their continued rearward movements following said engagement will force the envelop back into the drier-chain.

In contemplating the succession of the actions performed in this machine it will be appreciated that the flaps are lifted from the plane of the top of the blank pile by the pickers and gummers preparatory to the operations successively of the flap-folders, and that so soon as the end flaps have been overturned previously to the overturning of the front and rear flaps the retaining members 35 are withdrawn, so as to be out of the way of the front and rear flap folders, the end-flap folders I becoming and remaining retainers for the blank, preventing its displacement on top of the pile during the operations of folding over the front and rear flaps, although as the folder-plates J J^2 have their horizontal progression farther and farther inwardly the end-flap folder-plates I I become more and more retired, the retreat of the latter being sufficiently early and of sufficient extent as to avoid their constituting any impediment to the required inward movements of the other pair of folder-

plates disposed right angularly thereto. The straight and parallel edges of the fingers of the retainers H serve as the gages and formers on which to define the folding and creasing lines of the end-flap folders, and the end-flap folders, having widths about the same as the width of the envelop desired to be completed and their edges parallel, constitute the gages or formers, defining the lines on which the front and rear flaps will be folded and creased, and, again, on noting the drawing Fig. 4 it will be perceived that the peculiar oscillatory movement which the gummer G is permitted to have as it begins its rising motion is such as to upturn the flap which it has gummed and which it is picking away from the pile by swinging such flap from a center of motion more or less coincident with the longitudinal line on which the flap is to be folded and creased, the flap therefore being disposed about the time the gummer strips itself off therefrom most favorably for the engagement thereagainst and thereunder of the inner end of the folder-plate J , and that which has been said of the one gummer and its manner of action relatively to the front flap of the blank is pertinent in respect of the other gummer and rear flap of the blank.

In Fig. 7 the retainers for holding the uppermost blank on the pile during the first portion of the envelop-making operation and for serving as the former members over which the end flaps are folded and creased on suitably-separated parallel lines coincident with the ends of the completed envelop are illustrated as of a construction somewhat modified from that represented in the preceding figures in the drawings, and in this mechanism the retainers, here represented by H^2 , are shown as in the form of horizontal plates having straight edges 60 at one side and affixed on the upper ends of vertical shafts 62, four in number, corresponding to the number of said horizontal plates, and which shafts may most advantageously have their bearings for their rocking movements within the stationary gage-posts h , which by being made tubular perform the double duties of edgewise gaging the blank pile x and making the bearings for the shafts. The shafts at their lower ends are fitted into and supported by a frame or platform P , to which rising and falling movements are periodically imparted by cams 64 64 on the main shaft X , said cams operating under and against friction-rollers in depending lugs of the platform. The shafts 62 have pinions 65 near their lower portions with which the teeth of racks 66 engage, the racks being comprised in the opposite side bars or members of an approximately rectangular frame Q , having reciprocatory movement imparted thereto through the connection by link 67 with a lever 68, which is subject to the action of a face-cam 69 in one direction and a retracting-spring 70 in the other. The teeth

of the racks 66 66 at one end of the frame are arranged to mesh at and with the inner sides of the pinion, while the teeth of the racks at the other end of the frame are oppositely disposed and mesh with the teeth of the adjacent pinions at the outer sides thereof, the rack-formed bars of the frame having the offsets 72, as shown, and this reversed meshing of the rack teeth and pinions. To acquire this, arrangement is such that the reciprocations of the rack-bar frame cause the opposite end pairs of retainer-plates to have their motions of partial revolution in reverse direction from each other, so that the retainers may have changes of position at each end of the central portion *c* of the blank, as perceived relatively as between those shown in the full lines and those shown by the dotted lines in Fig. 7. In the operation of this mechanism the retainers H^2 will be understood as having the relative positions indicated by the dotted lines at the left of Fig. 7 when the gummerns and pickers are descending, the retainers being lowered onto the top of the pile, and the straight edges 60 are alined properly to define the end folding and creasing of the end flaps. Then in proper time in advance of the folding of the front and rear flaps the rack-provided frame *Q* by its movement causes the rotations of the shafts 62 and the swinging of the retainers out from under and within the folded-over end flaps, and in the intervening time before the next descent of the pickers the retainers will again have their positions of inward projection over the pile imparted thereto, following their bodily elevation, due to the elevation of the cam-actuating platform *P*, such platform, however, descending in time to bring the inturned retainers down onto what is then the top blank of the pile, all in good season before the next operation of the pickers and end-flap folders. This last-described mechanism has characteristics and capabilities which render it somewhat preferable over the form of the retainer mechanism comprising the swinging angular members hereinbefore described.

The machine having the devices and capabilities for folding over the end and front and rear flaps of the envelop at the pile, as has been described, is efficient for the production of envelops which while of the same general form as those commonly made are of unusual perfection and accuracy of form, especially by reason of the foldings being made with precision on lines which impart a complete and absolute closing of the envelop at all of its corners and assure truly rectangular shapes to the product.

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

1. In an envelop-machine, the combination with a blank-pile support, of front and rear flap gummerns, and end-flap pickers, blank-re-

tainers arranged to bear on the top blank of the pile and to move away therefrom, end-flap folders movable over the blank-pile support and front and rear flap folders also movable over said support. 70

2. In an envelop-machine, the combination with a blank-pile support, end-flap pickers and front and rear flap gummerns, of flap-folders operable adjacent said support for folding the flaps of the uppermost blank of the pile on said support. 75

3. In an envelop-machine, the combination with a blank-pile support, and pickers for the end flaps of end-flap folders mounted for reciprocatory movement adjacent said support and movable toward and from each other, over and away from over said support, and means for imparting their movements successively. 80

4. In an envelop-machine, the combination with a blank-pile support and pickers for the front and rear flaps, of front and rear flap folders mounted for reciprocatory movements adjacent said support and movable toward and from each other over and away from over said support, and means for imparting their movements successively. 85 90

5. In an envelop-machine, the combination with the blank-pile support, end-flap pickers, and front and rear flap gummerns, of end-flap folders located adjacent opposite ends of said support, and front and rear flap folders located adjacent the front and rear edges of said support, all said folders being mounted for reciprocatory movements, pairs thereof in lines at right angles to each other, and means for imparting the movements of said folders in succession over and away from over the support. 95 100

6. In an envelop-machine, the combination with a blank-pile support, of front and rear flap gummerns, and end-flap pickers, blank-retainers arranged to bear on the top blank of the pile and to move away therefrom, end-flap folders movable over the blank-pile support, front and rear flap folders also movable over said support, a drier and means for pushing the completed envelops off from the pile successively into the drier. 105 110

7. In an envelop-machine, the combination with a blank-pile support, end-flap pickers and front and rear flap gummerns, of flap-folders operable adjacent said support for folding the flaps of the blank on said support, and a device for pushing the envelop off from the pile. 115

8. In an envelop-machine, the combination with a blank-pile support, and pickers for end flaps of a blank-retainer movable to engage and disengage the top blank of the pile, and means for actuating it, end-flap folders mounted for reciprocatory movement adjacent said support and movable toward and from each other over and away from over said support, and means for imparting their movements successively. 120 125

9. In an envelop-machine, the combination with a blank-pile support and pickers for the 130

front and rear flaps, of a blank-retainer movable to engage and disengage the top blank of the pile, means for actuating it, front and rear flap folders mounted for reciprocatory movements adjacent said support and movable toward and from each other over and away from over said support, and means for imparting their movements successively.

10 In an envelop-machine, the combination with the blank-pile support, end-flap pickers, and front and rear flap gummern, of end-flap folders located adjacent opposite ends of said support, and front and rear flap folders located adjacent the front and rear edges of
15 said support, all said folders being mounted for reciprocatory movements, the pairs thereof in lines at right angles to each other, means for imparting the movements of said folders in succession, over and away from over the
20 support, a drier located to the rear of and adjacent the pile-support, and a reciprocatory pusher operable to push the successively-completed envelops off from the pile into the drier.

11. In an envelop-machine, the combination
25 with a support for a pile of blanks, of a front-flap gummer, means for folding the end flaps of the envelop operable at the pile, and a front-flap folder movable, over and away from over, the pile, and having a roller for pressing
30 the gummed folded front flap upon the end flaps.

12. In an envelop-machine, the combination with the support for a pile of envelop-blanks, of a front-flap gummer, means for folding the
35 end flaps operable at the pile, of a front-flap folder consisting of a reciprocatory plate movable over, and away from over, the pile, having an aperture therein and having a roller horizontally mounted for rotation on an axis
40 at right angles to the line of movement of the plate, and having its under portion extended through said aperture, for the purpose set forth.

13. In an envelop-machine, the combination
45 with the support for a pile of envelop-blanks, a pair of retainer members movable to engage and disengage the top blank of the pile, each having a straight edge and such edges arranged in separation corresponding to the length of
50 the envelop to be made, front and rear flap gummern, and a pair of pneumatic pickers, arranged for reciprocation over, and toward and away from the front and rear portions and the opposite end portions of the pile, and
55 respective means for imparting the reciprocatory movements to the gummern and the pickers, of end-flap folders arranged for back-and-forth movements over and away from over the top blank of the pile, to overturn
60 and fold the end flaps on the lines defined by the opposite edges of said retainers, means for imparting the reciprocatory movements to the end-flap folders, and means for imparting the blank engaging and disengaging move-
65 ments to the retainers.

14. In an envelop-machine, the combination with the support for a pile of envelop-blanks, reciprocatory gummern arranged over the front and rear portions of the pile, reciprocatory pickers arranged over the end portions
70 of the pile, and respective means for imparting the reciprocatory movements to the gummern and pickers, of a pair of reciprocating end-flap folder-plates, having widths corresponding to the width of the envelop to be
75 made, and front and rear flap folders operable relatively to the position of the pile to fold the front and rear flaps on longitudinal lines defined by the front and rear edges of the end-flap folders.
80

15. In an envelop-machine, the combination with the support for a pile of envelop-blanks, reciprocatory gummern arranged over the front and rear portions of the pile, a reciprocatory picker arranged over an end portion of
85 the pile and respective means for imparting the reciprocatory movements to the gummern and to said picker, of a pair of reciprocating end-flap folder-plates, movable over and away from over the end portions of the blanks, and
90 each having an edge arranged to correspond with the folding-line of one of the long flaps of the envelops, a gummer for one of the long flaps, and a horizontally-reciprocating folder cooperating with the alined edges of the end-
95 flap folders, to fold such long flap on the line defined by said alined edges.

16. In an envelop-machine, the combination with a support for a pile of blanks, of a front-flap gummer, means for folding the end flaps
100 of the envelop operable at the pile, a front-flap folder marginally guided and movable over, and away from over, the pile, a cam, a lever operated thereby, and a link connecting the lever and the front-flap folder.
105

17. In an envelop-machine, the combination with the support for a pile of envelop-blanks, of a front-flap gummer, means for folding the end flaps operable at the pile, of a front-flap
110 folder consisting of a reciprocatory plate movable over and away from over the pile, having an aperture therein and having a roller horizontally mounted for rotation on an axis at right angles to the line of movement of the
115 plate, and downwardly spring-pressed and having the under portion of its periphery extending through said aperture for the purpose set forth.

18. In an envelop-machine, the combination with the support for a pile of envelop-blanks,
120 of a pair of retainer members movable to engage and disengage the top blank of the pile and having straight edges and arranged in separation corresponding to the length of the envelop to be made, of endwise-located pneumatic
125 pickers, end-flap folders operable in relation to the position of the blanks on said support, to overturn and fold the end flaps on the lines defined by said retainers, means for imparting the blank engaging and disengag-
130

ing movement to the retainers, front and rear flap gummers and front and rear flap folders movable toward and away from each other over the pile, in a line at right angles to the

5 movements of the end-flap folders.

19. In an envelop-machine, the combination with the support for a pile of envelop-blanks, a pair of reciprocatory pneumatic end-flap pickers, and front and rear flap reciprocatory
10 gummers, respectively arranged over and for movements toward and away from the front and rear and the opposite end portions of the pile, and respective means for imparting vertical reciprocatory motions thereto, of a pair
15 of reciprocating end-flap folder-plates, having widths corresponding to the width of the envelop to be made, and front and rear flap folders operable relatively to the position of the pile to fold the front and rear flaps on longitudinal lines defined by the front and rear
20 edges of the end-flap folders, and a pusher for discharging the completed envelop from the top of the pile.

20. In an envelop-machine, the combination
25 with the support for a pile of envelop-blanks, and a pair of reciprocating end-flap folder-plates, movable over and away from over the end portions of the blanks and having an edge located to correspond with the folding-line of
30 one of the long flaps of the envelops, a gummer for one of the long flaps, and a horizontally-reciprocating folder cooperating with the alined edges of the end-flap folders, to fold such long flap on the line defined by said alined
35 edges, means for reciprocating the front-flap folders, a pair of rotary cams 42, the angular levers 40 cooperating therewith, and connections between arms of said lever and the end-flap folders.

40 21. In an envelop-machine, the combination with a blank-pile support, of front and rear flap gummers, and a pair of end-flap pickers, of the pair of end-flap folders movable toward
45 and from each other over the pile, the front and rear flap folders having reciprocatory movements over the pile in a line at right angles to the movement of the end-flap folders, and a rod 50 arranged in the line of movement of the front-flap folder and adapted to
50 engage under the folded rear flap adjacent its folding-line, and means for imparting reciprocatory movements to said rod.

22. In an envelop-machine, the combination with a blank-pile support, of front and rear
55 flap gummers, and a pair of end-flap pickers, of the pair of end-flap folders movable toward and from each other over the pile, the front and rear flap folders having reciprocatory movements over the pile in a line at right
60 angles to the movement of the end-flap folders, a rotary cam, a cam-operated lever, and a pair of rods 50 50 united and pivotally connected at the front of the machine and pivotally engaged with said cam-actuated lever.

65 23. In an envelop-machine, the combination

with a support for the pile of envelop-blanks, a gum-roller mounted thereover and having means for supplying gum in conjunction therewith, of a vertical shaft having a reciprocatory
70 movement in a vertical line and having at its lower end a transversely-extended gummer-support which is bodily movable with said shaft, a gummer pivotally mounted on said support to have bodily a vertically-reciprocating motion in unison therewith, and means
75 for causing the gummer to have in its lowermost position, its gumming-face horizontal, and in its elevated position its gumming-face vertical, whereby in its rising movement its then vertical face will move in contact with
80 the periphery of the gum-roller.

24. In an envelop-machine, the combination with a support for the pile of envelop-blanks, a pair of gum-boxes supported stationary opposite each other and over said support, a
85 gum-roller having a peripheral portion extended beyond the side of each gum-box and means for supplying gum from the box onto each so-located roller, of a vertically-guided and vertically-reciprocating plunger-shaft
90 having opposite horizontal extensions at its bottom movable in unison with said shaft, gummers pivotally mounted on said extensions and bodily movable in vertical paths in unison therewith, springs for causing the gum-
95 mers to have normally positions on said extensions with their gumming-faces vertical, whereby on the elevation of the gummers they will have bearings vertically across the sides of the said gum-rollers, and stationary members relatively to which the gummers in their
100 descent have impingements whereby they are swung on said extensions so that their gumming-faces are brought into horizontal planes, for the purposes set forth.

25. In an envelop-machine, the combination with a support for the pile of envelop-blanks, a gum-roller mounted thereover and having means for supplying gum in conjunction therewith, of a vertically-reciprocatory gummer-
110 support, a gummer having a horizontal stud pivotally mounted on said support, a spring encircling the stud having one end connected thereto, and its other with said support, and means for swinging the gummer in its lowered
115 position with its gumming-face horizontal.

26. In an envelop-machine, the combination with a blank-pile support and a reciprocatory plunger-shaft having on a member thereof a
120 gummer pivotally mounted and having a lever member, of an abutment against which said gummer-lever member contacts in the descent of the plunger-shaft whereby the gumming-face of the gummer is caused to assume a horizontal position, and a spring applied to
125 the gummer to cause on its ascent and withdrawal above said abutment, the gummer to be swung so that its gumming-face moves to a position angular to its working horizontal plane.

27. In an envelop-machine, the combination with a reciprocatory plunger-shaft having horizontal bracket 23, and depending fork-like member 24, of a gummer G comprising the 5 gummer-body and an angular extension comprising the lever member *n*, and said extension having intermediately a pivot-stud *j* affixed thereto, said stud having bearings in and an extension beyond the fork-like member, 10 the spiral spring *k* operative to force the gummer with its gumming-face vertical, and the stationary member *o* against which the lever extension of the gummer in its downward movement contacts, substantially as described. 15

28. In an envelop-machine, the combination with the support for the pile of envelop-blanks, of front and rear vertical shafts mounted for rotational, and for rising and falling, movements, and having horizontally-extending 20 members, means for raising and lowering said shafts, and means for periodically imparting rotational movements thereto, for the purposes set forth.

29. In an envelop-machine, the combination with the support for the blank pile, and the gage-posts having positions edgewise adjacent the pile, and formed tubular, of shafts 30 mounted for rotation and adapted for endwise movement in and through said tubular posts, and having horizontal retainer members at their upper ends, means for periodically raising and lowering the shafts, and means for periodically imparting rotational 35 movements thereto.

30. In an envelop-machine, the combination with a blank-pile support and adjacent tubular bearing members, of the vertical shafts having horizontally-extending retainer members at their upper ends, and having pinions 40 at their lower end portions, and a support P by which the lower ends of the shafts are sustained, racks in engagement with the pinions, means for reciprocating the racks, and means 45 for imparting vertically-reciprocatory movements to said support P.

31. In an envelop-machine, the combination with the elevator-support for the pile of envelop-blanks, and front and rear vertical 50 shafts mounted for rotational, and for rising and falling movements, and having horizontally-extending members, means for raising and lowering said shafts, and means for periodically imparting rotational movements 55 thereto, of end-flap pickers and end-flap fold-

ers operable relatively to the top of the pile, and coacting in their folding operations with said horizontally-extending members.

32. In an envelop-machine, the combination with the elevator-support for the blank pile, 60 and the four tubular gage-posts having positions edgewise adjacent the pile, the end pairs thereof having a separation approximately the same as the length of the envelop to be made, 65 of shafts mounted for rotation and adapted for endwise movement in and through said tubular posts, and having horizontal retainer members H^2 at their upper ends, each having a straight edge 60, means for periodically raising and 70 lowering the shafts, and means for periodically imparting rotational movements thereto.

33. In an envelop-machine, the combination with a blank-pile support and adjacent tubular bearing members, of the vertical shafts having 75 horizontally-extending retainer members at their upper ends, having pinions at their lower end portions, and a platform P in which the lower ends of the shafts are supported to turn, racks in engagement with the pinions, means 80 for reciprocating the racks, and rotary cams, which support and impart vertically-reciprocatory movements to said platform P.

34. In an envelop-machine, the combination with the blank-pile support C, and the adjacent 85 front and rear pairs of vertical tubular stationary gage-posts *h*, of the vertical shafts 62 having horizontal members H^2 at their upper ends, each having a straight edge portion 60, end pairs thereof being separated corresponding 90 to the length of the completed envelop, said shafts having the pinions 65, the platform P supporting the several shafts, the frame Q having the opposite side members thereof formed with offset portions and constructed 95 with oppositely-facing rack-teeth, meshing into the relatively adjacent pinions at opposite sides thereof, the rotary shaft having one or more cams 64 constituting a raising and lowering 100 support for the platform, and having a cam 69, a lever 68 operated by said cam and connected to the frame Q and a spring for moving said frame reversely of its cam-imparted movement.

Signed by me at Springfield, Massachusetts, in presence of two subscribing witnesses.

SIDNEY A. GRANT.

Witnesses:

WM. S. BELLOWS,
FRANK GRANT.