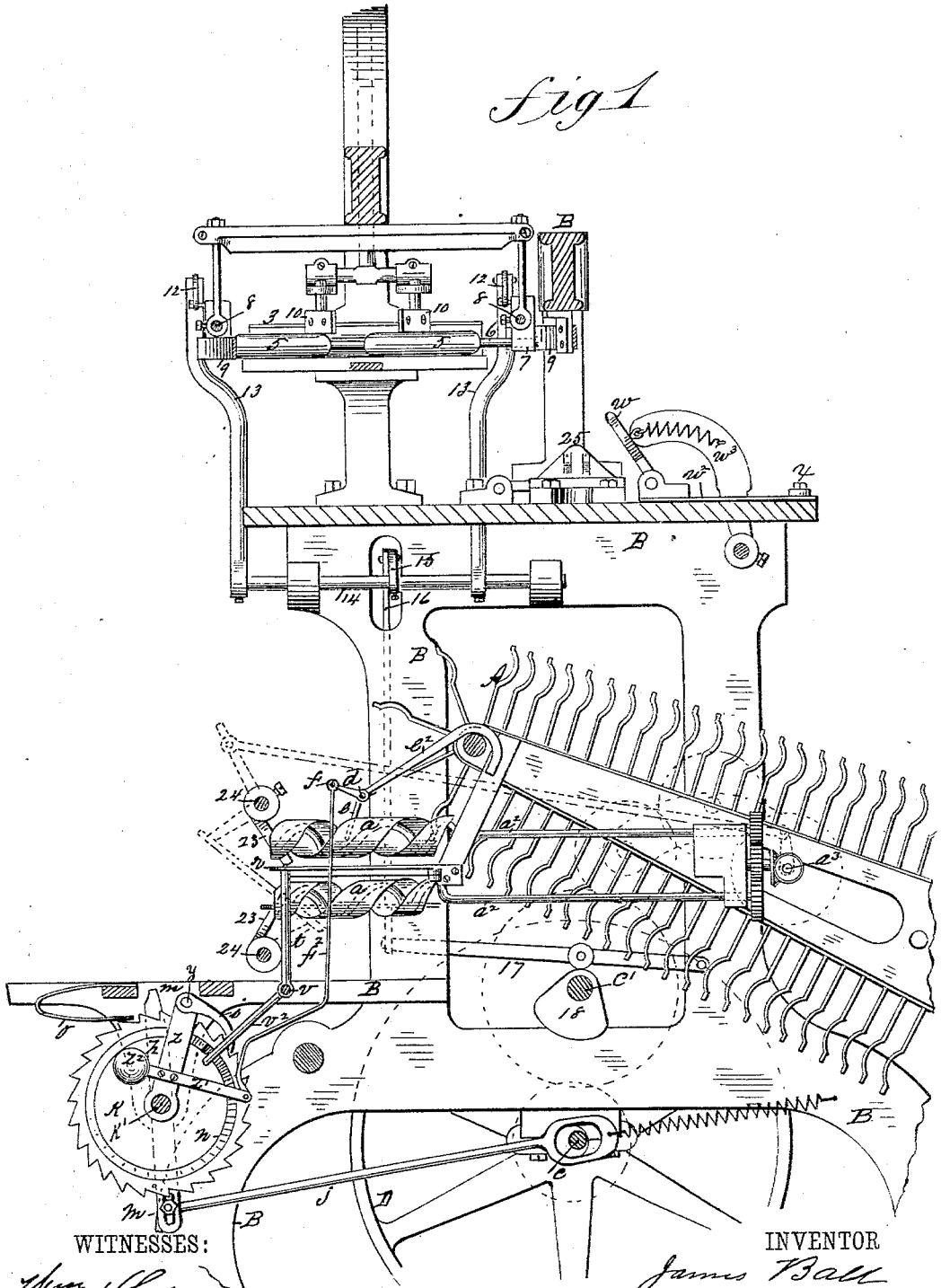
(No Model.) 4 Sheets—Sheet 1.

J. BALL.

ENVELOPE MACHINE.

No. 303,971. Patented Aug. 26, 1884.

Fig 1



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(No Model.) 4 Sheets—Sheet 2.

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ENVELOPE MACHINE.

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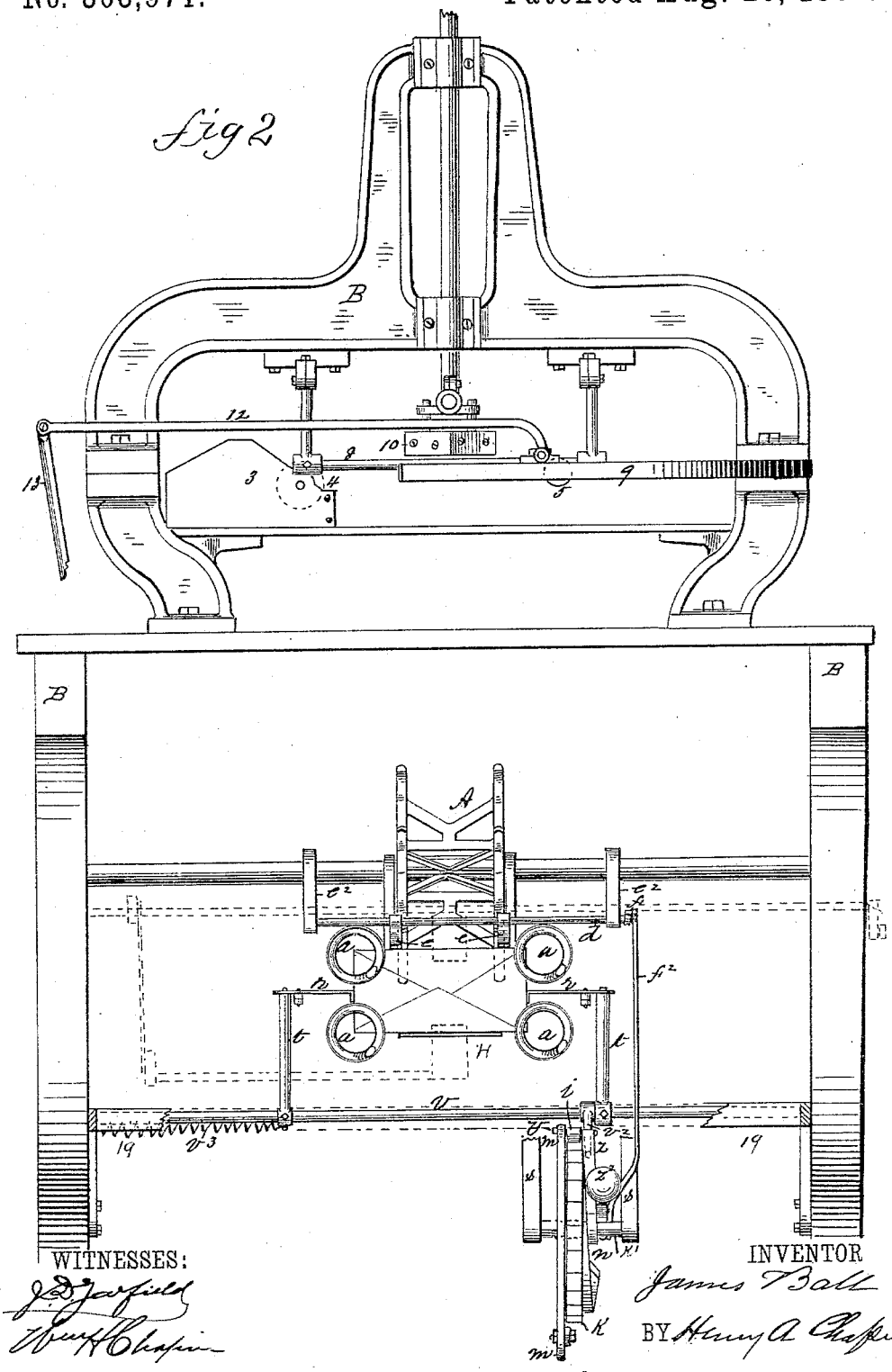
Fig 2



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(No Model.) 4 Sheets—Sheet 3.

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ENVELOPE MACHINE.

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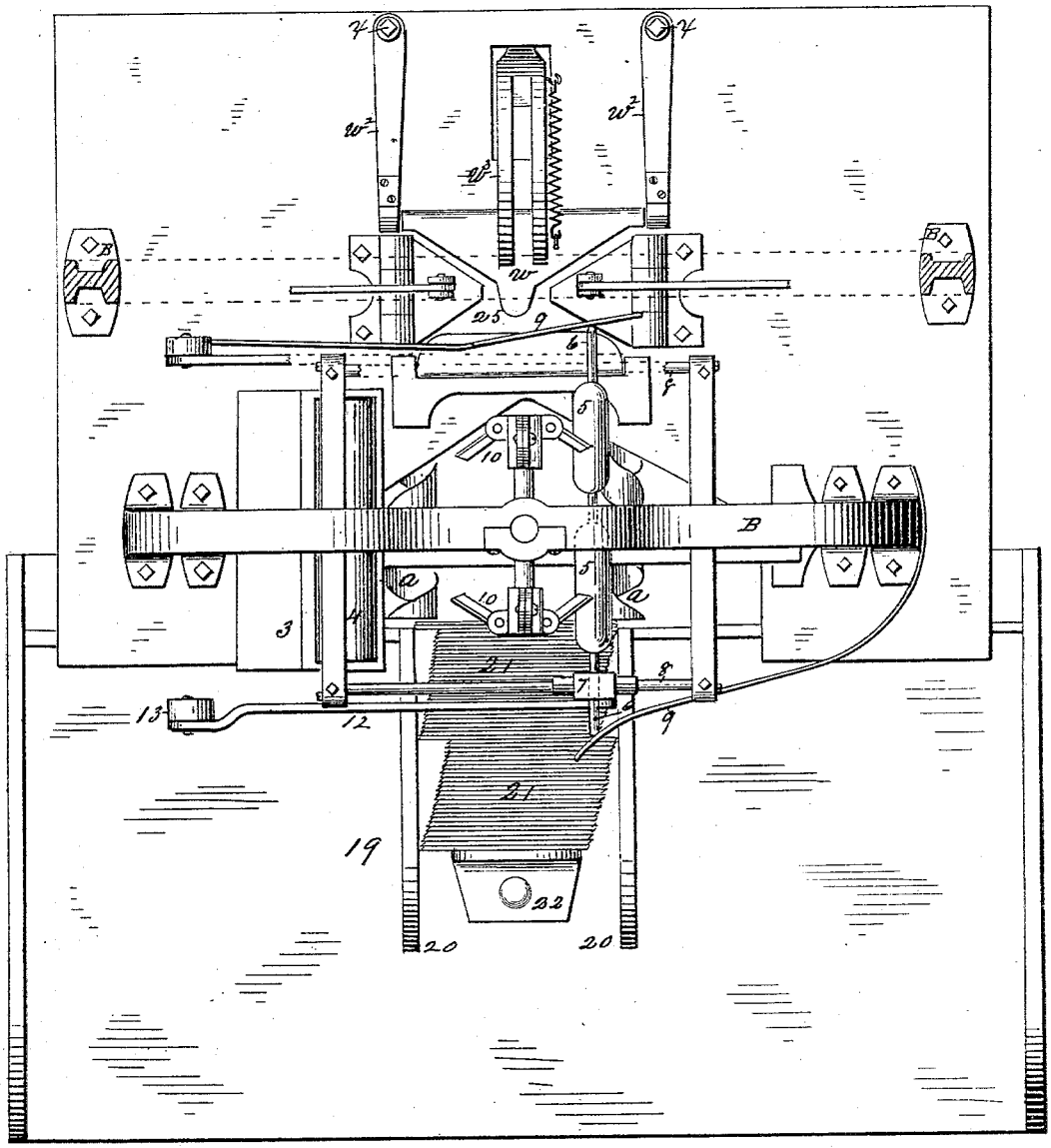
Fig 5



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(No Model.) 4 Sheets—Sheet 4.

J. BALL.

ENVELOPE MACHINE.

No. 303,971. Patented Aug. 26, 1884.

Fig 4

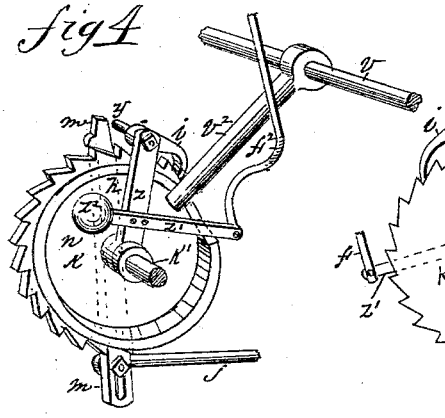


Fig 5

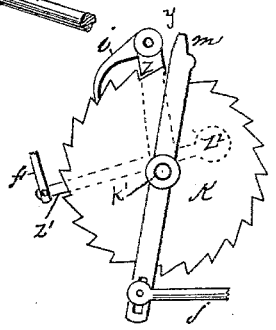
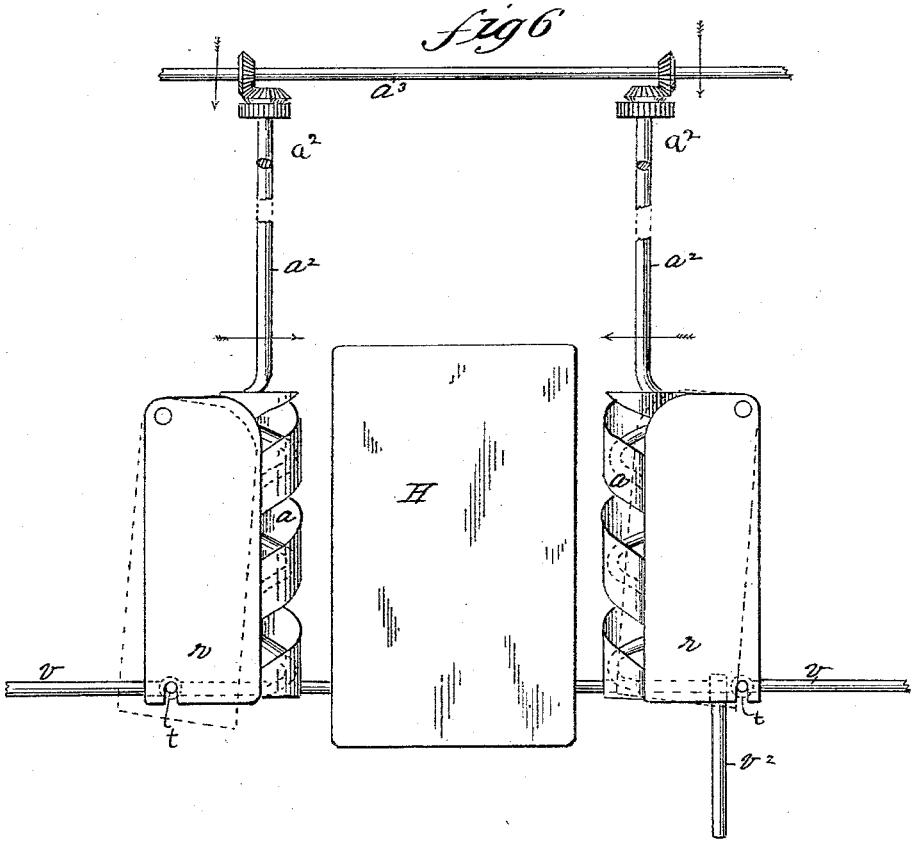


Fig 6



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UNITED STATES PATENT OFFICE.

JAMES BALL, OF HOLYOKE, MASSACHUSETTS.

ENVELOPE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 303,971, dated August 26, 1884.

Application filed October 3, 1883. (No model.)

To all whom it may concern:

Be it known that I, JAMES BALL, a citizen of the United States, residing at Holyoke, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Envelope-Machines, of which the following is a specification.

This invention relates to improvements in envelope-machines, and particularly to the gumming, folding, conveying, counting, and bunching mechanism of such machines, the object being to simplify the construction of the gumming devices and to facilitate their rapid operation; to improve the manner of hanging the wings of the folding-box; to provide improved mechanism for conveying folded envelopes from the drying-chain to the table, and for counting each envelope so conveyed, and for arranging the counted envelopes in convenient groups of a certain number preparatory to banding them.

In the drawings forming part of this specification, Figure 1 is a side elevation, partly in section, of certain main parts of an envelope-machine, having applied thereto gumming, folding, conveying, and counting mechanism constructed according to my invention. Fig. 2 is an end elevation. Fig. 3 is a plan view. Figs. 4 and 5 are details of the counting mechanism detached from the machine; and Fig. 6 illustrates details of certain parts of the conveying and grouping mechanism, also detached from the machine.

In the drawings, B indicates parts of the usual frame of the machine, of which *c* is the driving-shaft, *d* the driving-pulley, and *c'* a cam-shaft.

The gum-box is indicated by 3, and the usual rotating gum-roller therein by 4.

The picker gumming-roller 5 is hung in boxes 7, in which it is capable of a reciprocating movement in the direction of its length. The boxes 7 are adapted to have a reciprocating movement upon their supporting-rods 8, by means of two swinging levers 13, which are secured to a rock-shaft, 14, the latter being actuated by its connection with shaft *c'*, by the cam 18, lever 17, rod 16, and arm 15. Any convenient retracting-spring holds lever 17 in contact with cam 18. The levers 13 are connected to the roller-boxes 7 by the connecting-rods 12. The movement given to the gumming-roller 5, under the pickers 10, whereby the latter are gummed, causes roller 5 to be moved against the gum-roller 4, thence from the latter under and against the face of the pickers and beyond the latter, where it rests an instant while the picker descends and rises, and then back again next to the gum-roller 4, where it again rests while the picker moves as before; but previous to the return movement of roller 5 to the roller 4 the former is given the aforesaid movement in the direction of its length, as it also is just before it comes in contact with roller 4. The purpose of said shifting movement of the gumming-roller 5 is to cause different parts of its surface to be rolled against the face of the picker as it moves back and forth under the latter, and said movement is imparted to it by the guide-strips 9 9, one being so located that the end of the roller-shaft will strike it after, in moving from the gum-box, it has passed under the picker, and the other is placed opposite the other end of said shaft, and in such position that the end of the latter will strike it as the roller moves toward the gum-box, carrying roller 5 back to the position it occupied in boxes 7 before the first-named guide-strip shifted it.

The above-described arrangement of gumming-roller and shifting devices obviates the requirement of two gum rollers and boxes for gumming-roller 5, so that the surface on it which rolls against the picker shall be supplied with gum for its two movements, for after having been in contact with the picker in going from box 3 it is moved endwise before it goes back to cause that part of its gummed face which has not been rolled against the picker to be brought against the latter in its return movement. Thus a well-gummed surface is carried against the picker at each movement of roller 5, although it has been subjected but once to a contact with the gum-roller 4.

The back-flap wing, *w*, of the folding-box 25 is hinged in bearings which are attached to the ends of flat springs w^2 w^2, which are secured to the machine by bolts *x x*, which pass through their ends.

It often occurs from some cause that the thickness of the combined paper and gum which comes under said wing when the envelope is folded varies more or less, and it is

desirable that the wing or wings of the folding box be hung in yielding bearings, rigid enough to hold the wing against ordinary resistance, but capable of yielding if the latter be too great; hence the use of the said springs w^2, or other suitable means, for accomplishing the object described. Wing w is operated by arm w^3.

After the envelopes have been gummed and folded they are dropped into the usual chain, A, between the fingers of which they are carried from the folding-box and finally brought toward the table 19, on the front side of the machine; and for taking the envelopes from the chain, counting, and grouping them upon table 19, as shown in Fig. 3, where said groups are indicated by 21, the following devices are employed:

A series of spiral carriers, each lettered a, are hung on the ends of shafts a^2, which are properly supported on the frame of the machine. The shafts a^2 are given a rotary motion by gear-connection with a shaft, a^3. (See Figs. 1 and 6.) The carriers a (see Fig. 2) are arranged at such distance from center to center that the ends of the envelope can enter them, as shown in said figure, and the rear ends of the carriers reach back a little each side of the chain A, so that an envelope which is brought along to the carriers by the latter has its ends engaged by the spirals, and is by them carried forward toward the table 19. The plate H, Fig. 6, is supported between the carriers a, and the bottom edge of the envelope rests thereon as it moves. The table 19 is located so that envelopes moving forward, as above described, will slide onto it, as seen in Fig. 3.

Under table 19, hung on a shaft, K′, is a ratchet-wheel, K, provided with twenty-five teeth, and having on its side a cam, n. A pawl-lever, m, is also hung on shaft K′, and has an oscillating motion imparted to it by a cam on shaft, c, through the connecting-rod j. The lever m extends above the upper edge of wheel K. A spring, o, rests on wheel K, to restrain its rotation, so that it shall not turn any farther than the pawl carries it.

A pawl-supporting device, h, consisting of an arm, z, on which the pawl i is hung, and an arm, z', on arm z, to one end of which is secured a balance-weight, z^2, is delicately hung on shaft K′, so that the preponderance of weight is slightly on the pawl side of the device. A pin, y, on which the pawl is hung, extends far enough over the edge of wheel K to have the end of arm m strike it when it is within the reach of the oscillating movement of said arm. Shaft K′ has its bearings in the hangers s s.

A rock-shaft, d, is hung in supports e^2 above the carriers a, and has thereon two wings, e, which extend downward between the carriers, so that an envelope which is being moved along by them, as above described, will hit the ends of said wings and rock the shaft d, on which is an arm, f, which is connected with the said arm z' by the connecting-rod f^2. Thus an envelope being moved along by the carriers a strikes wings e, rocking shaft d, and causing the pawl-arm z to swing back. The pawl i engages with a tooth on wheel K, and brings pin y where lever m strikes it, and rotates the wheel the extent of one tooth, this operation taking place each time an envelope goes under wings e; and wheel K is not acted upon by lever m unless pawl i is first caused to take a proper position by the passage of an envelope, as aforesaid.

Two grouping-guides, r r, are pivoted between the carriers a—one between each pair—and are capable of a lateral movement, as indicated by the dotted lines in Fig. 6. The front ends of the guides r are made to engage with two vertical arms, t t, which are secured on a sliding rod, v, to which a spring, v^3, is attached, and on which is an arm, v^2, which extends down by the side of wheel K and bears against the edge of the cam n thereon. When wheel K is turned, as above described, rod v is made to slide to the right (looking at Figs. 2 and 6) as each envelope passes in the carriers until (wheel K having made one revolution) arm v^2 drops off from the high end of cam n and allows spring v^3 to draw rod v to the left, swinging the guides r r, as indicated by the dotted lines. Thus the envelopes, one by one, are given a different position in the carriers by the position relative to the latter of the edges of the guides r, the latter continuing to swing laterally to the right while the envelopes, in passing, cause wheel K to be turned, and when the wheel has once rotated dropping back, leaving just twenty-five envelopes in one or several groups, 21, on the table 19, as shown, and in convenient position to be seized by the right-hand back corner thereof by the operator, separated from the group behind it, and banded. The envelopes, after having passed between the guides r r, are struck from behind by oscillating arms or wings 23, which are secured on shafts 24 24 and pushed forward between the guide-strips 20 on the table 19 and against the stop 22.

The shafts 24 are operated by any convenient connection with other parts of the machine, as indicated by dotted lines in Fig. 1.

What I claim as my invention is—

1. In an envelope-machine, the chain A and mechanism for receiving folded envelopes from said chain and conveying them to the table of the machine, consisting of a series of rotating spiral carriers and operating mechanism, substantially as described, adapted to engage with each end of the envelope, and a supporting-plate located intermediately between the carriers, combined and operating substantially as set forth.

2. The combination, in an envelope-machine, of a series of rotating spiral carriers, substantially as described, of pivoted grouping-guides to swing in the plane of the rotation of the carriers, and of operating mechanism, substantially as described, operated by the passage of envelopes between the carriers, for causing said guides to swing to and fro while

envelopes are passing between them, substantially as set forth.

3. The combination, in an envelope-machine, of a ratchet-wheel, of a pawl, and of pawl-supporting devices, substantially as described, adapted to have an oscillating movement by the side of said wheel, of a pawl-lever having an oscillating movement by the side of said wheel independent of said pawl-supporting devices, and of mechanism, substantially as described, actuated by the passage of envelopes through the machine, for bringing said pawl-supporting devices into engagement with said oscillating pawl-lever, whereby said wheel is made to rotate intermittently, substantially as set forth.

4. The combination, in an envelope-machine, of a series of rotating spiral envelope-carriers, substantially as described, of pivoted grouping-guides, substantially as described, to swing in the plane of the rotation of the carriers, of a ratchet-wheel having a cam thereon, of a pawl supported by the side of said wheel, of a pawl-lever having an oscillating movement by the side of said wheel independent of the pawl-supporting devices, and of mechanism, substantially as described, whereby, by the passage of an envelope between said carriers, said ratchet-wheel is caused to be turned, and said grouping-guides to be swung on their pivots, substantially as set forth.

5. In combination, the spiral carriers, the shaft *d*, connected with arm *z'*, and having wings *e e* thereon, the pawl *i*, pawl-supporting devices *h*, the ratchet-wheel K, and lever *m*, substantially as set forth.

6. The combination, with the spiral carriers *a*, the grouping-guides *r r*, and the ratchet-wheel having the cam *n* thereon, of the rod *v*, connected with said guides, and having the arm v^2 thereon, and the spring v^3, substantially as set forth.

7. The combination, with the ratchet-wheel K and pawl *i*, of the oscillating pawl-supporting device, consisting of the arm *z*, having thereon the arm *z'*, and the weight z^2 on the latter, of the pin *y* through arm *z*, the lever *m*, rock-shaft *d*, having arms *e*, and mechanism, substantially as described, connecting said rock-shaft to the arm *z'*, and the lever *m*, substantially as set forth.

8. The combination, with the folding-wing *w*, and with bearings therefor, of the spring-straps w^2, supporting said bearings, and secured by one end only to the machine, substantially as set forth.

9. The combination, with the picker gumming-roller of an envelope-machine, and with means, substantially as described, for moving it back and forth past the picker, of mechanism, substantially as described, for moving said roller endwise after passing the picker, substantially as set forth.

10. The combination, with the picker gumming-roller of an envelope-machine, of bearings therefor capable, by means, substantially as described, of reciprocating movements past the picker, and of shifting guides, substantially as described, to move said roller endwise after passing the picker, substantially as set forth.

11. The combination, with the picker gumming-roller 5, and mechanism, substantially as described, for supporting and moving it reciprocally past the pickers, of the inclined guides 9, located near the ends of the shaft of said roller, substantially as set forth.

JAMES BALL.

Witnesses:
GEO. N. TYNER,
JAS. T. ABBE.