

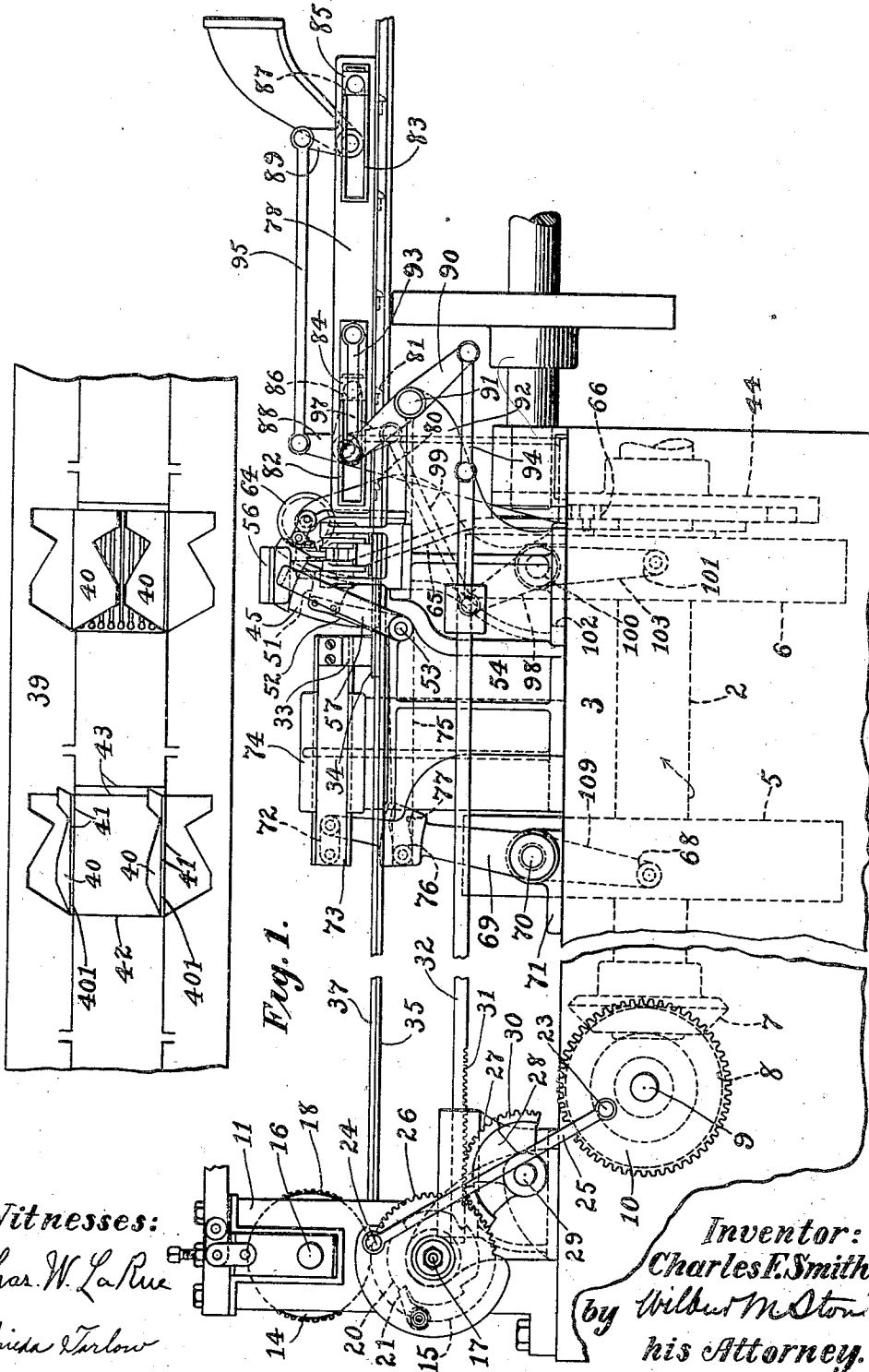
C. F. SMITH.
PACKAGING MACHINE.
APPLICATION FILED JULY 27, 1911.

1,049,003.

Patented Dec. 31, 1912.

3 SHEETS—SHEET 1.

A Fig. 6. B



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Elfrida Trolow

Inventor:
Charles F. Smith
by Wilbur M. Stone
his Attorney.

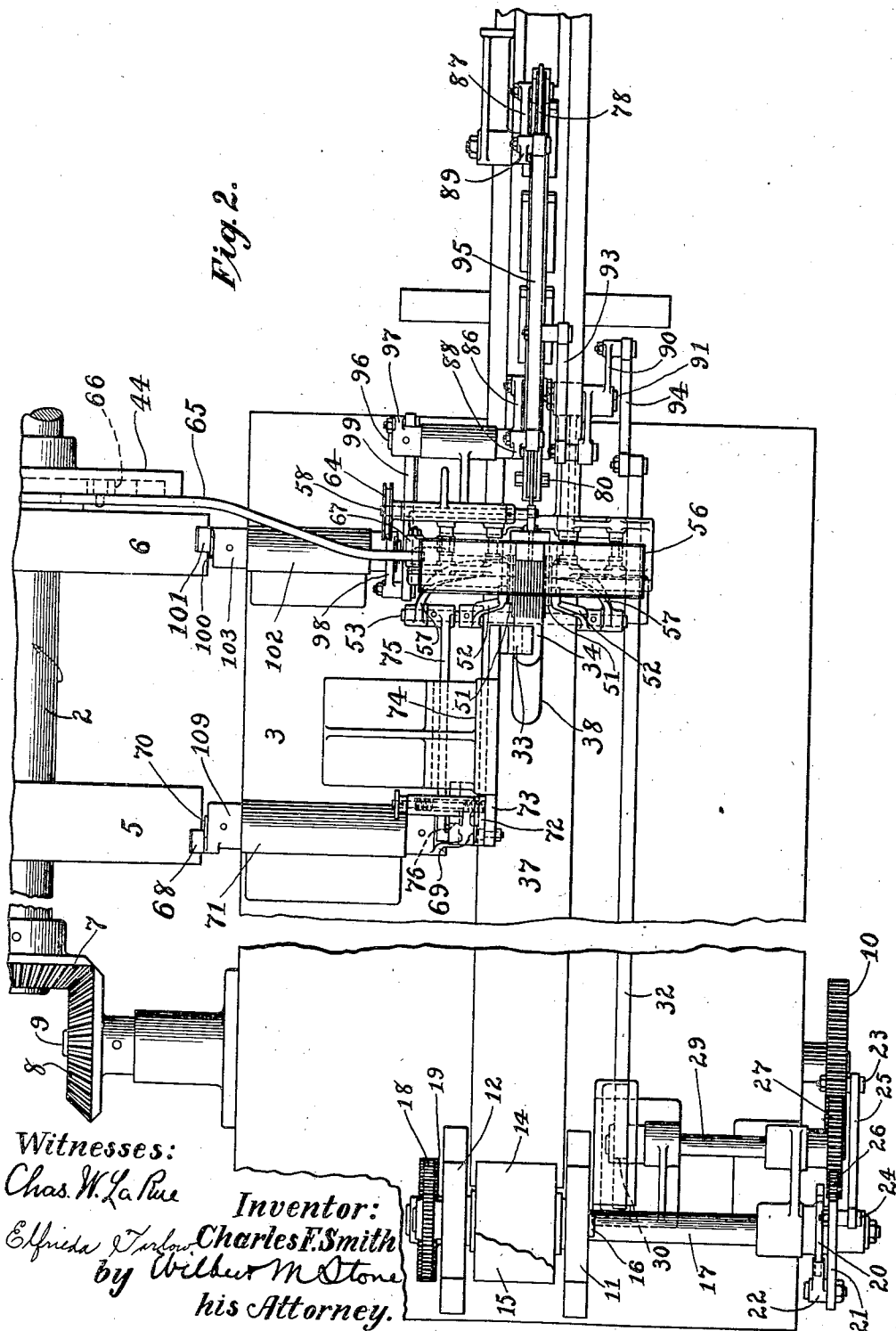
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3 SHEETS-SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 4.

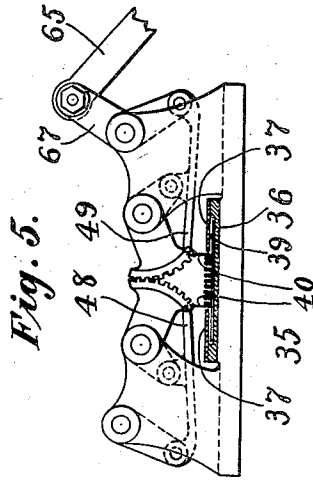
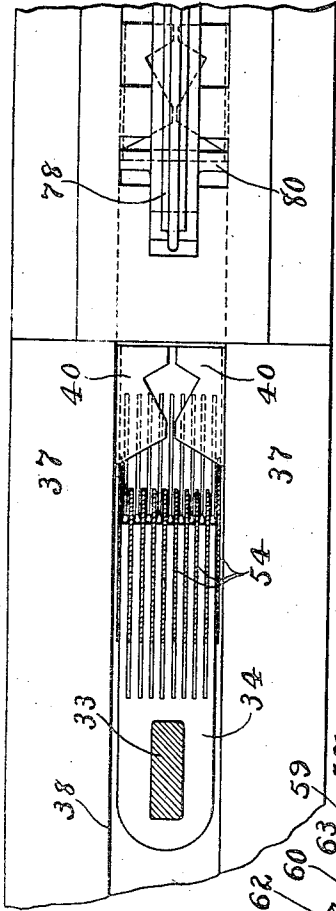
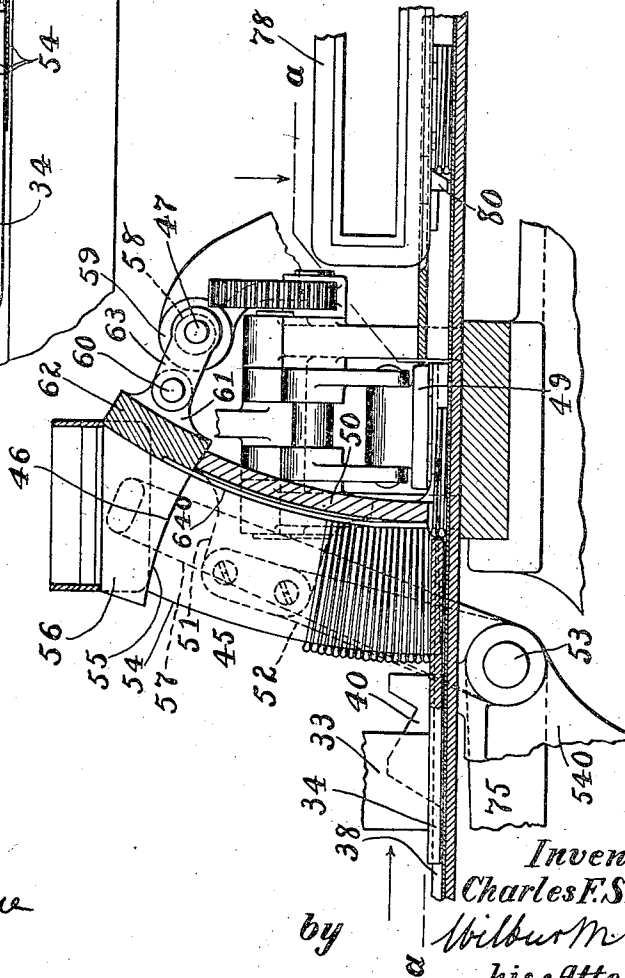


Fig. 3.



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UNITED STATES PATENT OFFICE.

CHARLES F. SMITH, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO ANITA SAFETY MATCH COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

PACKAGING-MACHINE.

1,049,003.

Specification of Letters Patent.

Patented Dec. 31, 1912.

Application filed July 27, 1911. Serial No. 640,729.

To all whom it may concern:

Be it known that I, CHARLES F. SMITH, a citizen of the United States, and a resident of Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Packaging-Machines, of which the following is a specification.

This invention relates to packaging machines and particularly to that class thereof which is adapted for forming packages from a continuous web of paper or other sheet material and for inclosing in said packages matches, toothpicks, or other articles.

The object of my present improvements is to provide means for advancing the partially finished packages and means for delivering the matches or other articles to be inclosed, in predetermined quantity, to said partially finished package.

The present invention is in the nature of improvements on the subject matter of my co-pending renewed application Serial No. 633,590, refiled June 16, 1911, for improvements in packaging machines.

To these ends my improvements comprise means illustrated in their preferred form in the drawings accompanying this application, wherein—

Figure 1 is a side elevation of a portion of a packaging machine embodying my improvements. Fig. 2 is a plan view corresponding therewith. Fig. 3 is a sectional side elevation on an enlarged scale of a detail of my improved mechanism and Fig. 4 is a corresponding sectional plan view on line *a—**a* of Fig. 3. Fig. 5 is an end elevation of the side-flap folding means. Fig. 6 is an enlarged plan view of a portion of the match package strip.

Main shaft 2 is supported at the rear of bed 3 of the machine, Fig. 2, in bearings, not shown, and has fixed thereto cams 5, 6, 44 and bevel gear 7. Said shaft may be driven in the direction of its arrow from any suitable source of power not shown. Bevel gear 7 drives bevel gear 8 on cross shaft 9, and said shaft has crank disk 10 fixed to the front end thereof, Figs. 1 and 2. Upstanding from bed 3 are frames 11, 12, in which are mounted feed rolls 14, 15 on shafts 16, 17, respectively. Lower shaft 17 has gear 19 fixed to the rear end thereof and drives gear 18 thereabove on shaft 16.

Fixed to the front end of shaft 17 is ratchet 20 and pawl disk 21 turns freely on said shaft outboard said ratchet. Pawl 22 is pivotally mounted on the inner face of said disk 21 for engagement with said ratchet. Ratchet 20 is provided with four teeth and pawl disk 21 may be oscillated back and forth on shaft 17 a quarter revolution from crank pin 23 on disk 10 connected with crank pin 24 on said disk 21 by means of pitman 25.

Pawl disk 21 is provided with gear teeth 26 in engagement with teeth 27 of segment 28, fixed to cross shaft 29. Teeth 26 and 27 of disk 21 will impart a quarter revolution to segment 28 and shaft 29. On the inner end of rock shaft 29 is fixed segment gear 30 meshing with rack 31 of reciprocable rod 32. Said rod 32 is efficient to reciprocate the package feeding mechanism, as hereinafter described.

For guiding and supporting the continuous strip of material from which the successive match packages are made, from feed rolls 14, 15, through the side flap punching and creasing mechanism, not shown, to the side flap folding mechanism of Fig. 5, I provide table 35 grooved at 36 to receive said strip 39, Figs. 5 and 6, and having a cover 37. Said cover is slotted at 38 to admit the passage of match plunger 34.

Chute 45 comprises back 50 having side ears 51, 51, from which arms 52, 52, reach downwardly for support to rock shaft 53 having its bearing in bracket 540 upstanding from bed 3. Between side ears 51, 51 and fixed to back 50, are mounted a plurality of thin parallel walls 54, 54 between which the matches descend by gravity onto the mid-portion (widthwise) of package strip 39, Fig. 5. The upper face 55 of chute 45 is curved concentric with shaft 53 and thereabove is mounted hopper 56 having its lower face 46 curved concentric with and contiguous to said upper face 55 of chute 45. Hopper 56 is supported from shaft 53 by opposite arms 57, 57 turning freely on said shaft. Said hopper may be joggled to assist matches deposited therein, to enter between walls 54, 54 of chute 45, by means of crank 47 on shaft 58 having a bearing in ear 59. Said crank is connected to pin 60 in ear 61 of back 62 of hopper 56 by link or pitman 63. A pulley 64 is fixed to the outer end

of shaft 58, and by means of a belt not shown shaft 58 may be rotated rapidly to joggle said hopper 56. The openings between adjacent walls 54, 54 of chute 45 are provided with false bottoms as 640, fixed at their upper ends to back 62 of hopper 56 and if desired at their lower ends to back 50 of chute 45. By this means the descending matches may be joggled continuously but in decreasing amount as they pass downwardly from hopper 56 to the package.

For folding the side flaps 40, 40 of the package from position A to position B, Fig. 6, I provide means best shown in Figs. 3 and 5, comprising a pair of opposite folders 48, 49 mounted for movement downwardly and inwardly in unison. Said folders are actuated from cam 44 on shaft 2 through cam roll 66 on cam arm 65. The upper end of said arm 65 is pivoted to arm 67 of folder 49. Match plunger 34 is provided to deliver from the bottom of chute 45 one or more horizontal rows of matches into the partly folded package under folders 48, 49. The present machine is arranged to deliver two such rows at one operation. Said plunger is actuated from cam 5 on shaft 2 through cam roll 68 on the lower end of cam arm 109 fixed to shaft 70 in ear 71 fixed to bed 3. The upper end of arm 69, fixed to shaft 70, is connected by pivotally mounted link 72 to slide 73 to the forward end of which is fixed plunger arm 33. Said slide 73 is mounted for movement parallel to the direction of travel of the package strip, in bracket 74 upstanding from bed 3. For lifting back 50 of chute 45 to permit the heads of the matches to pass under said back, shaft 53 has arm 75 fixed thereto. Said arm has roll 76 pivoted at its outer end for engagement with cam slot 77 formed in arm 69.

As it is usually found expedient to supplement the action of feed rolls 14, 15 by other means, I preferably employ a supplemental feeding mechanism located near the right hand end of the machine, Fig. 1, comprising one or more push bars 80, 81 for engagement with the heels of upfolded side walls 401, 401 of the match package. Also as said bars 80, 81 extend across the full width of the package they are sufficient to counteract any tendencies to unevenness lengthwise in the position of the matches in the package. Said push bars as 80, 81 are fixed at suitable distances apart to the lower face of slide 78. Said slide is mounted for movement forwardly in the direction of travel of package strip 39 with bars 80, 81 in operative engagement with said strip; then away from said strip so as to withdraw said bars from engagement and then backwardly and downwardly to engage bars 80, 81 with the next succeeding packages respectively. To accomplish these movements

slide 78 is provided with two slots 82, 83 near opposite ends thereof respectively and said slots are provided with blocks 84, 85 slidable therein respectively. Said blocks are pivotally fixed to lower arms 86, 87 of bell cranks 88, 89, all respectively. To cause slide 78 to move forwardly and backwardly in the direction of travel of strip 39 arm 90 is pivoted midway its length at 91 in bracket 92 fixed to bed 3. The upper end of said arm is connected to slide 78 by pivotally mounted link 93 and the lower end is connected to reciprocating rod 32 by pivotally mounted link 94. As rod 32 is reciprocated by the same mechanism that intermittently rotates feed rolls 14, 15 said rolls and slide 78 will be operated in unison to forward said strip 39. For raising and lowering said slide 78 at proper times and in parallelism with strip 39, I provide the following means: Bell cranks 88, 89 are connected by pivotally mounted link 95, and shaft 96 fixed in bell crank 88 has arm 97 fixed thereto. The free end of said arm 97 is connected to the upper end of arm 98 by pivotally mounted link 99. Said arm 98 is fixed to shaft 100 turning in bearing 102 on bed 3. Arm 103 fixed to said shaft 100 has roll 101 in the lower end thereof in engagement with cam 6 on shaft 2.

Operation: The continuous strip of material 39, from which the successive match packages are made, is fed forwardly intermittently in increments having a length slightly in excess of that required for a match package, by means of feed rolls 14, 15. Said strip of material is advanced over table 35, and somewhere between said feed rolls 14, 15 and bracket 74 the side profiles of the package are cut, creases 41, 42, 43 are formed and side flaps 40, 40 are folded up, all by mechanism not shown herein but fully shown and described in my co-pending application referred to hereinbefore. Said side flaps 40, 40 being folded up as shown in Fig. 3 the partly finished package is advanced with said side flaps upstanding on either side of chute 45, and with the bottom of said package below said chute and under plunger 34. The intermittent advance of said strip 39 being timed so as to bring opposite upstanding side flaps 40, 40 at rest between opposite folders 48, 49; said folders thereupon move inwardly and downwardly folding said side flaps into approximate parallelism, thus forming a rectangular tube for the reception of the matches. Either simultaneously with or directly following the folding of said side flaps 40, 40 match plunger 34 moves forwardly pushing two rows of matches into the package under said flaps. When the matches have progressed about half way into said package, chute 45 is tipped up slightly about axis 53, whereby the heel of back 50 is lifted to allow

the heads of the matches to pass out from said chute, Fig. 3. During the hereinbefore described operation shaft 58 has been rotating rapidly, thereby joggling hopper 56 and assisting the matches into chute 45. After the matches are fully in place in said package, slide 78, being in the position of Fig. 3, moves forwardly and bars 80, 81 push the side-folded and filled packages forwardly one increment of advance, coincident with the advancing of the package strip 39 by rolls 14, 15. Said slide 78 having reached the end of its stroke toward the right hand, Figs. 1 and 3, bell cranks 88, 89 are actuated to lift said slide, which then returns to advance said strip and packages another increment.

I claim:

1. A match packaging machine including in combination, means for intermittently advancing a web of material having side flaps formed therein, match feeding means comprising a hopper for receiving the matches, means for agitating said hopper, a match chute for guiding the matches toward the web of material, having a plurality of parallel guides, means for ejecting a plurality of matches from between the lower ends of said guides and means for lifting said chute to permit the passage of the matches from thereunder.

2. Delivery mechanism including in combination, a match chute for guiding the matches toward a web of material, having a plurality of parallel guides, means for ejecting a plurality of matches from between the lower ends of said guides and means for lifting said chute to permit the passage of the matches from thereunder.

3. Delivery mechanism including in combination, a hopper for receiving the matches, means for agitating said hopper, a match chute for guiding the matches toward a web of material, having a plurality of parallel guides, and false bottoms fixed to said hopper and extending into the spaces between said parallel guides for agitating the matches between the guides.

4. Delivery mechanism including in combination, a pivotally mounted hopper for receiving the matches, means for agitating said hopper and a match chute pivotally mounted coaxially with said hopper and having a plurality of parallel guides for guiding the matches toward a web of material.

5. Delivery mechanism including in combination, a pivotally mounted hopper for receiving the matches, means for agitating said hopper, a match chute pivotally mounted coaxially with said hopper and having a plurality of parallel guides for guiding the matches toward a web of material, means connected with said hopper and extending into the spaces between said parallel

guides for agitating the matches between the guides, means for ejecting a plurality of matches from between the lower ends of said guides and means for rocking said chute on its pivot to permit the passage of matches from thereunder.

6. A match packaging machine including in combination, means for intermittently advancing a web of material having side flaps formed therein, match feeding means comprising a match chute having a plurality of parallel guides for guiding the matches toward the web of material, means for ejecting a plurality of matches from between the lower ends of said guides, means for folding the side flaps, supplemental means for advancing the web of material having the side flaps folded therein comprising a slide, a push bar on said slide for successive engagement with the folded side flaps, means for reciprocating the slide in parallelism with said web, means for moving said slide toward and from said web and means for timing said slide with the web intermittent advancing means

7. Delivery mechanism including in combination, a match chute having a plurality of parallel guides, for guiding the matches toward the web of material, means for ejecting a plurality of matches from between the lower ends of said guides, means for lifting said chute to permit the passage of the matches from thereunder, means for folding the side flaps and supplemental means for advancing the web of material having the side flaps folded therein comprising a slide, a push bar on said slide for successive engagement with the folded side flaps, means for reciprocating the slide in parallelism with said web, means for moving said slide toward and from said web.

8. A match packaging machine including in combination, means for intermittently advancing a web of material having side flaps formed therein, match feeding means comprising a pivotally mounted hopper for receiving the matches, means for agitating said hopper, a match chute mounted coaxially with said hopper and having a plurality of parallel guides for guiding the matches toward the web of material, and means connected with said hopper and extending into the spaces between said parallel guides for agitating the matches between the guides.

9. Delivery mechanism including in combination, a pivotally mounted hopper for receiving the matches, means for agitating said hopper, a match chute pivotally mounted coaxially with said hopper and having a plurality of parallel guides for guiding the matches toward the web of material, means connected with said hopper and extending into the spaces between said parallel guides for agitating the matches between the guides,

means for ejecting a plurality of matches from between the lower ends of said guides and means for rocking said chute on its pivot to permit the passage of matches from thereunder.

10. Delivery mechanism including in combination, means for intermittently advancing a web of material having side flaps formed therein, means for folding the side flaps, supplemental means for advancing the web of material having the side flaps folded therein comprising a slide, a push bar on said slide for successive engagement with the folded side flaps, means for reciprocating the slide in parallelism with said web, means for moving said slide toward and from said web and means for timing said slide with the web intermittent advancing means.

11. Delivery mechanism including in combination, a pivotally mounted hopper for receiving the matches, means for agitating said hopper, a match chute pivotally mounted coaxially with said hopper and having a

plurality of parallel guides for guiding the matches toward the web of material, means for ejecting a plurality of matches from between the lower ends of said guides, means for rocking said chute on its pivot to permit the passage of matches from thereunder, means for folding the side flaps, supplemental means for advancing the web of material having the side flaps folded therein comprising a slide, a push bar on said slide for successive engagement with the folded side flaps, means for reciprocating the slide in parallelism with said web, means for moving said slide toward and from said web and means for timing said slide with the web intermittent advancing means.

Signed this 25th day of July, 1911, before two subscribing witnesses.

CHARLES F. SMITH.

Witnesses:

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CHAS. W. LA RUE.