

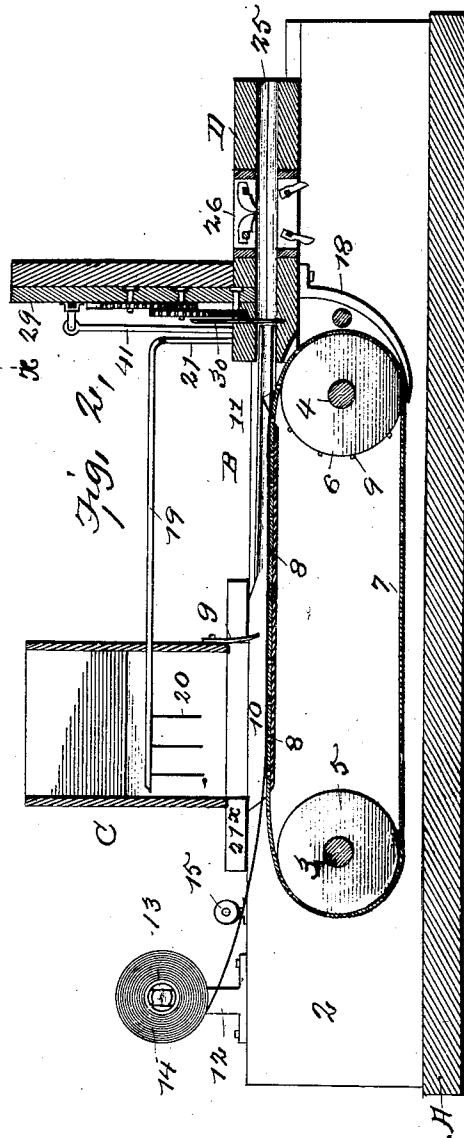
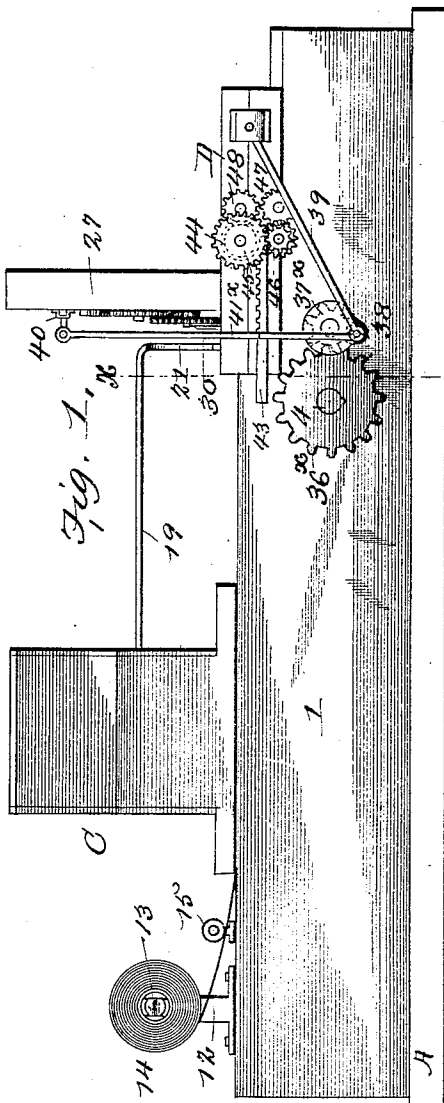
(No Model.)

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W. A. HUDSON.
CIGARETTE MACHINE.

No. 587,825.

Patented Aug. 10, 1897.



WITNESSES-

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Oat Land

INVENTOR-

William F. Hudson,
by A. G. Heylman
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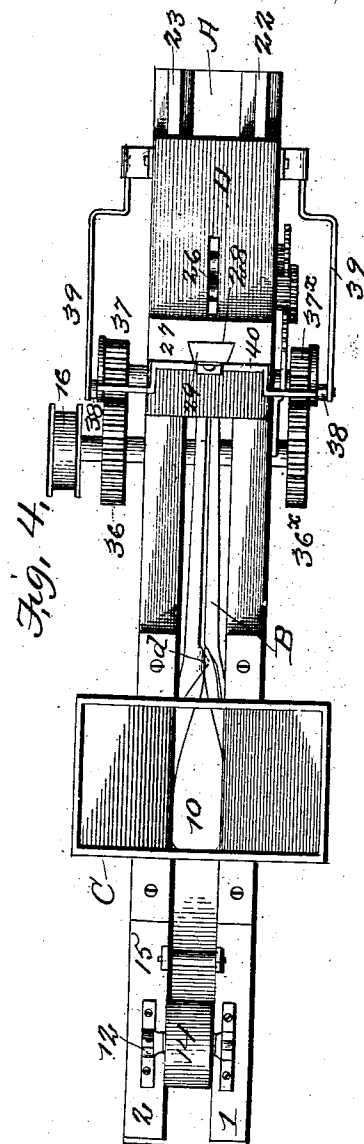
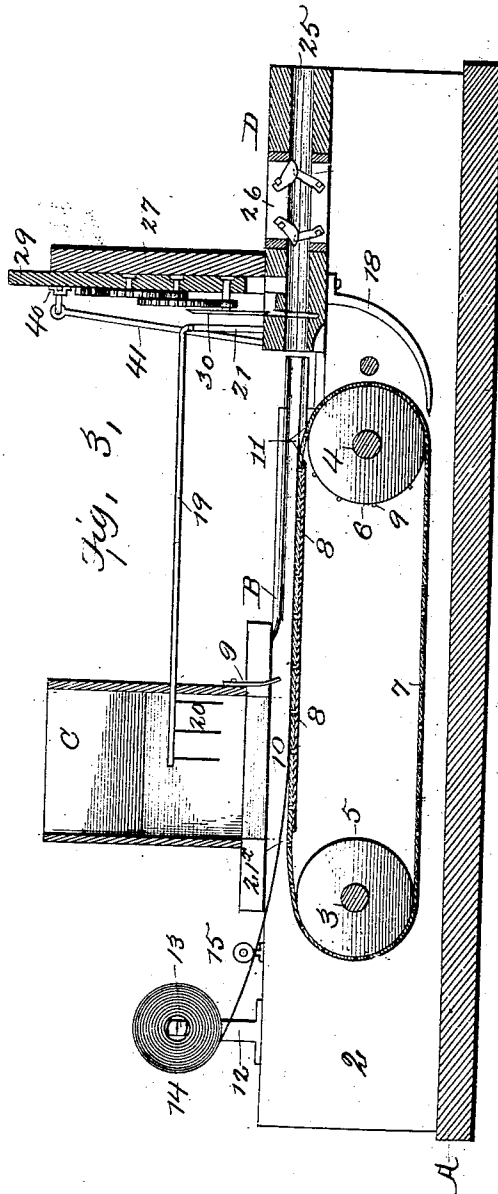
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(No Model.)

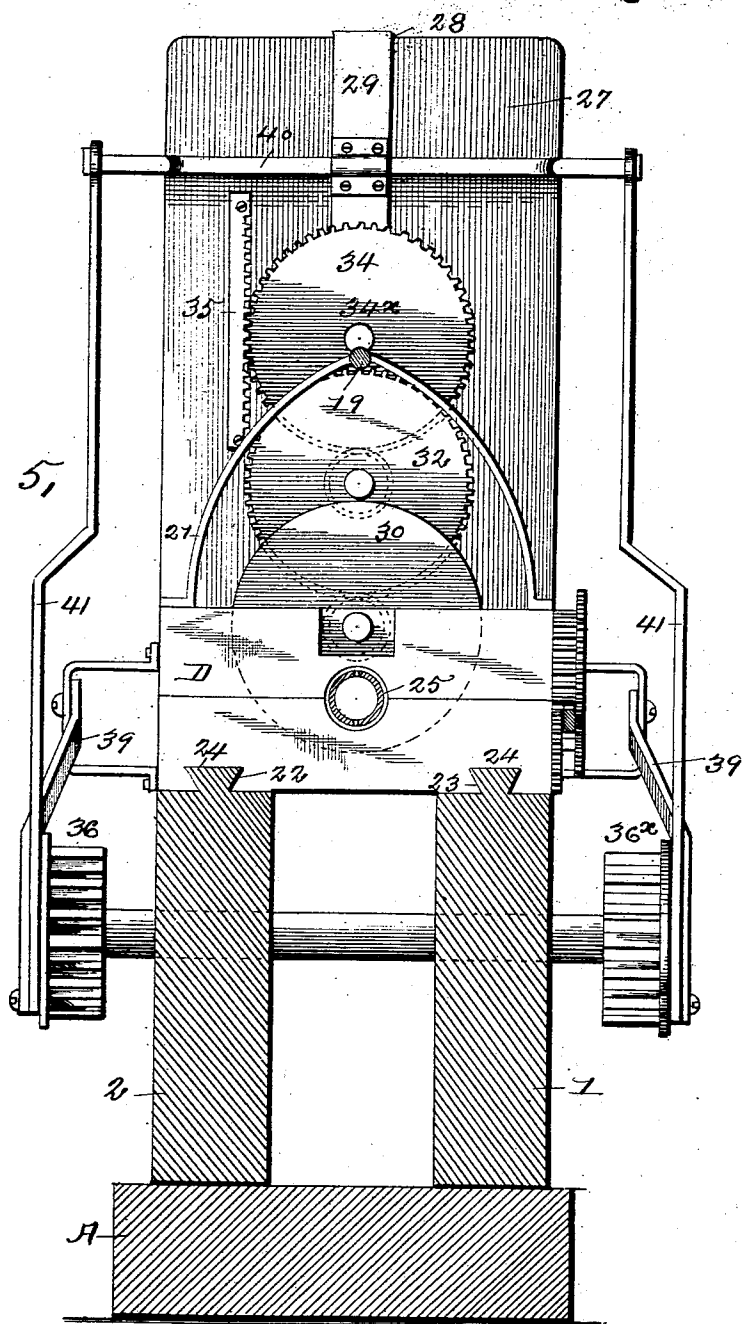
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Fig. 5.



WITNESSES

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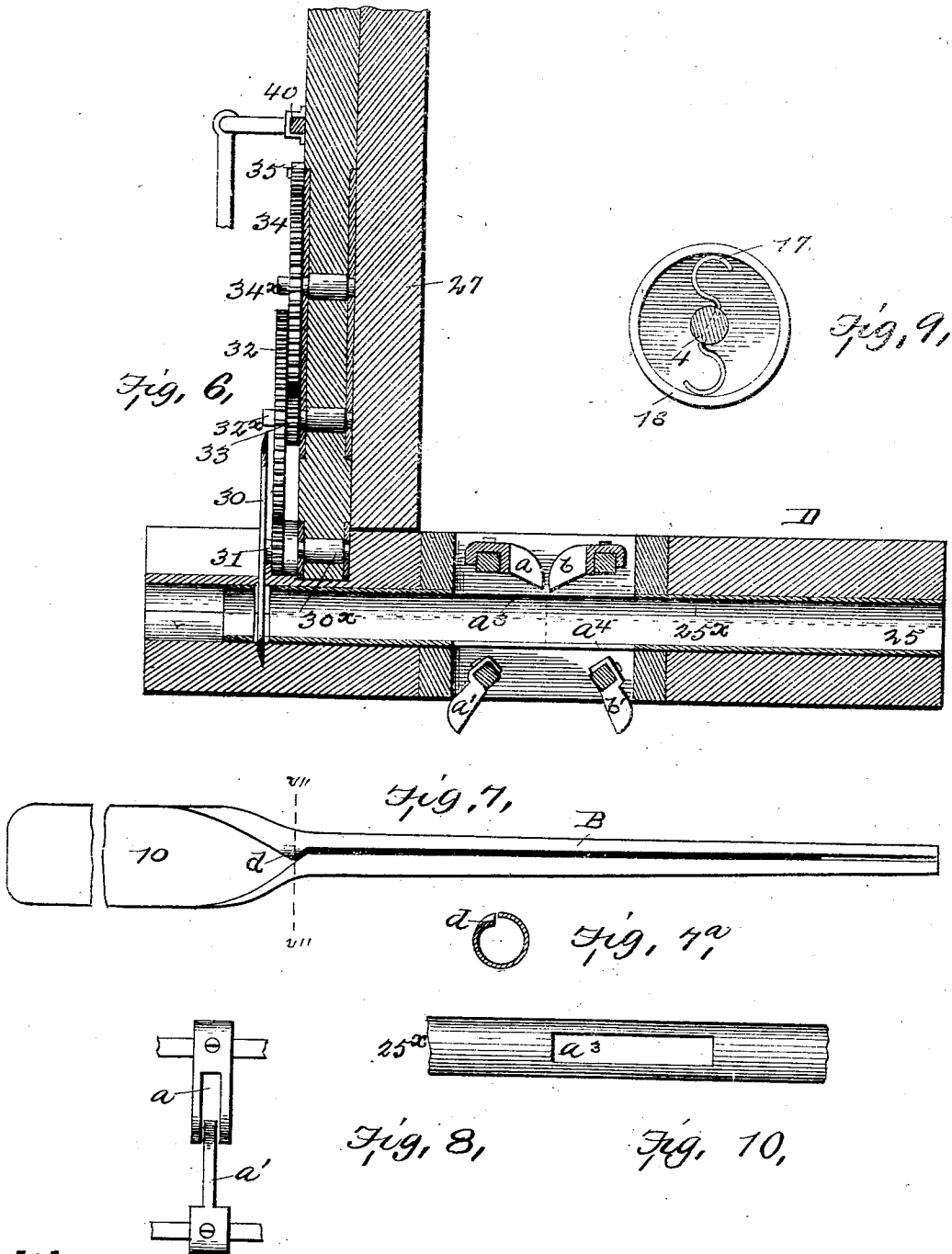
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W. A. HUDSON.
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UNITED STATES PATENT OFFICE.

WILLIAM A. HUDSON, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR,
BY DIRECT AND MESNE ASSIGNMENTS, TO THE LORENTZ CIGARETTE
MACHINE COMPANY, OF NEW YORK.

CIGARETTE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 587,825, dated August 10, 1897.

Application filed June 11, 1895. Renewed December 24, 1896. Serial No. 616,947. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM ARCH HUDSON, a citizen of the United States of America, residing in the city of Washington, in the District of Columbia, have invented a new and useful Cigarette-Machine, of which the following is a specification.

My invention has relation to improvements in cigarette-machines; and the object is to provide an improved and simplified machine for making, wrapping or enveloping, and crimping and closing or tucking in the ends of that-class of cigarettes known as "Spanish" cigarettes, as will be hereinafter fully specified and particularly claimed.

The invention is fully and clearly illustrated in the accompanying drawings, wherein—

Figure 1 is a side elevation of the machine, showing the gearing for operating the reciprocating frames of the cutting and tucking mechanism. Fig. 2 is a longitudinal vertical section showing the cutting mechanism in the position when severing the cigarette and the tucking-fingers open to permit the projection and passage of the cigarette through the tube or passage in the reciprocating frame. Fig. 3 is a longitudinal vertical section showing the cutting mechanism elevated and the tucking-fingers as in the position of engaging with the ends of the cigarette for the purpose of tucking or crimping the ends. Fig. 4 is a plan view of the machine. Fig. 5 is an enlarged view of the cutting mechanism in elevation and section through the frame of the machine, taken on the line *x x* of Fig. 1. Fig. 6 is a longitudinal vertical section of the reciprocating frame, showing the knife down and the tucking-fingers open. Fig. 7 is a detail plan of the forming-tube removed from the machine. Fig. 7^a is a transverse section of the forming-tube, taken on the line VII VII of Fig. 7. Fig. 8 is a detail view of two of the tucking-fingers in position of engagement when tucking the end of a cigarette. Fig. 9 is a detail of the driving-pulley, showing the spring-clutch for holding the pulley to the shaft. Fig. 10 is a detail of the tube in the reciprocating frame, showing the slots through which the tuckers engage.

A designates the base-piece of the frame, having mounted thereon and secured thereto

two side pieces 1 2, in or on which the mechanism is mounted and arranged. In the side pieces 1 2 are formed suitable bearings, in which are journaled two shafts 3 4, carrying rollers or drums 5 6, on which is arranged an endless carrying-belt 7. The belt may be perforated at determined distances, as at 8, to engage studs 9 on the drum 6 to insure uniform movement of the belt and prevent it from slipping during operation.

B designates the forming-tube, secured in the frame in horizontal alinement with the upper line of the carrying-belt, which passes through the tube and is made to take or assume a tubular conformation during the passage through the forming-tube. The forming-tube B is open at the receiving end 10, which is arranged under the hopper, and from thence is tubular and may be slightly tapered to the discharge end, so that the continuous cigarette is properly compressed during the passage through the tube. The under side of the forming-tube has an opening 11 therein, near the discharge end, through which the belt is led from the tube, the wrapped or enveloped continuous cigarette being pushed on through the remainder of the forming-tube and into the bore or tube of the reciprocating frame.

For convenience in putting the belt through the forming-tube or removing it therefrom the tube may be slit on the upper radial line from the entrance to a point opposite to the belt-opening in the under side, so that the belt may be laid in the tube, and after being arranged about the drums have the ends secured together, and if removal is required it may be lifted from the tube after the ends have been separated.

By leading the forming-belt through an opening in the tube short of the end thereof the continuous cigarette is released from the compression of the belt and carried forward through the extension of the tube and into the tube of the reciprocating carriage without tendency to break down or be otherwise disturbed or distorted by the unfolding of the belt at the point of leaving the continuous cigarette.

To carry the edges of the paper wrapper into a lapped position, one edge of the form-

ing-tube at the entrance thereof is formed with a folding or lapping device consisting of a projection *d*, extending across the slit or entrance to tube, and which is struck slightly down below the line of the tube, as shown in Figs. 7 and 7^a of the drawings, which carries one edge of the paper under the other edge and thus laps the edges of the wrapper, the lapped condition being maintained throughout the entire operation, resulting in the completed cigarette.

On the end of the frame is secured a support 12, carrying a shaft 13, on which is arranged the roll or web of paper 14, which is preferably led under a guide-roller 15, and thence through the forming-tube, and on and in contact with the upper surface of the endless carrying-belt. It is apparent that the paper rests flat and open on the belt at that part directly under the hopper and that as it is carried and drawn into the forming-tube by the belt with its supply of tobacco it is made to take a tubular form and closely wrap and completely envelop the contents. Motion may be imparted to the belt by means of a pulley 16 on the shaft 4 of the drum 6. This pulley 16 may be mounted on its shaft with sufficient rigidity to operate the mechanism during the process of manufacture, but if it is desirable or necessary to stop the movement of the belt during the time the knife is cutting through the filled paper tube a spring-clutch or other suitable holding device, as 17, may be used to hold the pulley, so as to slip when the load is increased. To make this stop, a brake 18 may be secured to the reciprocating carriage to engage with the belt and bear it against the drum, as shown in Fig. 2 of the drawings.

A hopper C is mounted on the frame of the machine, the discharge end of the hopper opening directly over the open and receiving end portion of the forming-tube, so as to always present the supply of tobacco to the paper below.

To prevent the tobacco in the hopper from becoming clogged or caked, a stirrer-rod 19 is provided, whereon are secured fingers 20, which agitate the tobacco. The rod 19 is carried back and secured to some convenient point on the reciprocating carriage, whereby when the carriage is carried back and forth the stirrer will be correspondingly moved and the tobacco kept free and loose in the hopper. The stirrer-rod 19 in the construction shown in the drawings has the outer end supported on a yoke 21, the limbs of which are secured to the floor of the reciprocating carriage, substantially as shown in Fig. 5 of the drawings.

In the bottom of the hopper is a sliding bottom 21^x, serving the purpose of stopping the feed of material whenever desired, and at the end of the hopper is adjustably secured a gate *g*, which may be raised or lowered to regulate the amount of tobacco necessary to make the feed even to the tube.

At the rear portion of the frame on the up-

per edges of the side pieces are formed or secured tracks 22 23, which take in ways 24 in the bottom face of the reciprocating carriage D. The carriage D has formed in it longitudinally and in alinement with the forming-tube a circular way 25, through which the cigarettes are pushed as they emerge from the forming-tube, and in the central portion of the carriage is an opening 26, adapted to receive the tucking-fingers. The way 25 may be lined with a smooth metal tube 25^x, substantially as shown in Fig. 6 of the drawings. The tube 25^x is formed with upper and lower alining slots *a*³ *a*⁴, through which the tucking-fingers have access to the cigarette during the operation of closing the ends thereof. On the carriage D is secured a vertical plate or standard 27, in which is formed a vertical groove 28, and arranged and fitted in this groove 28 is a substantial metal bar 29, carrying the cutting mechanism. The cutting mechanism consists of a circular knife 30, mounted on a stud-bearing 30^x, secured in the bar 29, the bearing 30^x also carrying a small gear-wheel 31, which meshes with a larger gear-wheel 32, on a stud-bearing 32^x, on which is another small gear-wheel 33, in turn meshing with a large gear-wheel 34, on a stud-bearing 34^x. On the plate 27 is a vertically-arranged rack-bar 35, which is engaged by the gear-wheel 34, substantially as shown in Figs. 5 and 6.

The carriage D is given longitudinal reciprocation by means of gear-wheels 36 and 36^x on the driving-shaft, meshing with smaller gear-wheels 37 37^x, each carrying a wrist-pin 38, to which is connected one end of the connecting-rods 39, having the other ends suitably connected to the carriage, substantially as shown in Figs. 1, 4, and 5.

The cutting mechanism is reciprocated by means of the following-described appliances: On the upper part of the bar 29 is rigidly secured a cross-bar 40, having the ends extended in both directions beyond the edges of the plate 27 and made in crank shape, and to the ends of this bar 40 are pivotally connected the pitmen-rods 41 41^x, the lower ends of which are pivotally connected to the wrist-pins 38, so that the bar 29 is raised and lowered when the wheels 37 37^x are rotated, the operative arrangement of the respective connections of the carriage and the cutting mechanism being such that when the knife is at its lower position the tuckers are open, as shown in Fig. 6 of the drawings, and when the knife is raised, as shown in Fig. 3 of the drawings, the tuckers engage the ends of the cigarettes, the rapid revolution of the knife being affected by the engagement of the uppermost gear-wheel with the stationary rack on the plate 27.

The tucking mechanism consists of upper and lower tucking-fingers *a a'*, arranged in pairs substantially as shown, and *b b'*, mounted on shafts journaled in the reciprocating carriage across the opening therein, as best

seen in Fig. 6 of the drawings, the upper fingers of each set being slotted to permit the lower finger of each set to engage in the slot and turn, crimp, or tuck, in the ends of the cigarettes.

To operate the tucking-fingers, a rack-bar 43 is secured to the stationary side piece of the frame of the machine, as shown in Figs. 1 and 4 of the drawings, and on the shaft of one of the upper sets of fingers is fixed a gear-wheel 44, to engage with the rack 43, and on the same shaft is another gear-wheel 45, which engages with the gear-wheel 46 on the shaft of the lower finger a' of that set, which gear 46 engages with a gear-wheel 47 on the shaft of the other lower tucking-finger, the upper finger of the rear set being rotated by means of the gear 48 meshing with the gear-wheel 44, substantially as shown in Fig. 1 of the drawings.

The gearings of the tucking-fingers are so proportioned as to cause the upper fingers to engage the cigarettes slightly in advance of the engagement of the lower fingers, so as to make the upper fold slightly in advance of the lower one, and so that the lower fingers press the lower fold slightly beyond the upper fingers, permitting them to be released from engagement without coming in contact with the lower fold when returning to their original open position.

The operation of the machine is as follows: The paper having been led into the forming-tube under the hopper and subjected to the supply of tobacco therefrom the machine may be started for operation, and the following steps of making and completing the cigarette will then take place: The wrapping or enveloping the tobacco will be effected as the paper with its contents is drawn through the forming-tube, which operation is continuous during the movements of the machine. While the cigarette-tube is being carried through the forming-tube in the direction of the tube of the reciprocating carriage and reaches the determined distance or length, being one half the length of the cigarette, the reciprocating carriage moves back, reaching the inner limit at a time when the cigarette has been moved the other remaining half of the length, and the knife descends and cuts off the cigarette. The carriage simultaneously therewith commences the outer movement and the knife begins to ascend, and the first set of fingers will tuck the outer or first end of that cigarette during the outer movement of the carriage, and then as the carriage returns the fingers are opened to permit the free passage of the moving cigarette-tube, which will push the first-made cigarette forward a length, and the knife will sever another cigarette, the adjacent ends of the two cigarettes arriving at the center of the opening in the carriage and at that point be subjected to the action of the tucking-fingers, the second or rear set of fingers tucking the inner end of the first-made cigarette, thus

completing it, and the first set tucking the outer end of the second cigarette, and so in succeeding movements the adjacent ends of two cigarettes as they arrive at the middle of the opening in the tube of the reciprocating carriage, as indicated by the dotted line a^5 , will be simultaneously tucked and closed, and this operation will be successively repeated.

It will be understood that the machine is primarily adapted to make cigarettes by a continuous and uninterrupted movement of the filled paper tube, and that it is discretionary to momentarily stop the progress of the filled paper tube during the operation of cutting and tucking.

I do not herein claim the broad process of making cigarettes by first forming a continuous cigarette, or stem, then forming therefrom separate cigarettes crimped at the ends, as such process is claimed in my application filed December 22, 1896, and given Serial No. 616,685.

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

1. The combination with the forming-tube and endless belt arranged as specified, of a reciprocating carriage formed with a longitudinal passage in alinement with the forming-tube and arranged to telescope therewith, a knife on the reciprocating carriage to sever a formed cigarette, and operatively-connected tucking-fingers arranged in the path of the longitudinal passage in the reciprocating carriage to crimp and close the ends of the cigarettes.

2. In a cigarette-machine, the combination of a reciprocating carriage, having a passage therethrough for a continuous cigarette, means to sever the continuous cigarette into determined lengths, and operatively-connected interengaging tucking-fingers to engage the severed and abutting ends of the adjacent cigarettes, substantially as and for the purpose set forth.

3. In a cigarette-machine the combination of the cutter for severing the continuous cigarette, the reciprocating carriage provided with a longitudinal passage therethrough to receive a continuous cigarette, means for reciprocating the carriage, and tucking-fingers journaled across the said passage arranged to grasp the end of a severed cigarette and the adjacent end of the continuous cigarette and close the paper over the contents thereof, substantially as specified.

4. In a cigarette-machine the combination of the longitudinally-reciprocating carriage provided with a longitudinal passage therethrough to receive a continuous cigarette, a vertically-reciprocating and revoluble knife on the carriage for severing the continuous cigarette, means for reciprocating the carriage, means for reciprocating and rotating the knife, tucking mechanism carried by said carriage and means for feeding the continu-

ous cigarette to said carriage, knife and tucking mechanisms, substantially as described.

- 5 In a cigarette-machine, the combination with a forming-tube, mechanism to carry a continuous cigarette therethrough, a reciprocating frame, a cutting mechanism to sever the continuous cigarette, comprising a vertical standard formed with a central vertical groove, a sliding bar in the groove, a rotatable knife on the bar, gearing on the bar to rotate the knife, a rack-bar on the standard to rotate the gearing, and means to reciprocate the sliding bar, substantially as and for the purpose specified.
- 15 6. The combination with a reciprocating carriage, formed with a longitudinal passage, of a slotted tube in the passage, and oppositely-rotating reciprocating tucking-fingers journaled in the carriage, adapted to enter the slot of the tube and grasp and tuck the adjacent ends of cigarettes in the tube, as described.
- 20 7. The combination of the endless carrying-belt, the reciprocating carriage, and a brake secured to the carriage arranged to engage the carrying-belt, and temporarily stop its movement.
- 25 8. The combination with the hopper, and the reciprocating carriage, of a stirrer in the hopper, the handle whereof is secured to the reciprocating carriage, substantially as described.
- 30 9. In a cigarette-machine, the combination with the forming-tube, and a reciprocating carriage, of a vertically-reciprocating and rotating knife to sever the continuous cigarette.

and tucking-fingers in the carriage to grasp the ends of the cigarettes and tuck the paper thereon during the passage through the carriage.

10. The combination with mechanism for forming a continuous rod or stem of tobacco and wrapping it with paper, of a cutter for severing the said wrapped rod into separate cigarettes and operatively-connected mechanism for crimping the paper at the ends of the cigarettes, substantially as specified.

11. The combination with mechanism for forming a continuous rod or stem of tobacco and wrapping it with paper, of a cutter for severing said wrapped rod or stem into separate cigarettes, and operatively-connected mechanism for crimping the paper wrapper at each side of each cut, substantially as described.

12. The combination of mechanism for forming a rod or stem of tobacco and wrapping it with paper, of a cutter for severing said wrapped rod or stem into separate cigarettes, two sets of crimping-fingers operating reversely of each other and placed to crimp the paper on both sides of each cut by the said cutter, and operatively connected with the forming mechanism, substantially as described.

In witness whereof I have hereto set my hand in the presence of two attesting witnesses.

WILLIAM A. HUDSON.

Attest:

A. G. HEYLMUN,
L. P. WHITAKER.