

(No Model.)

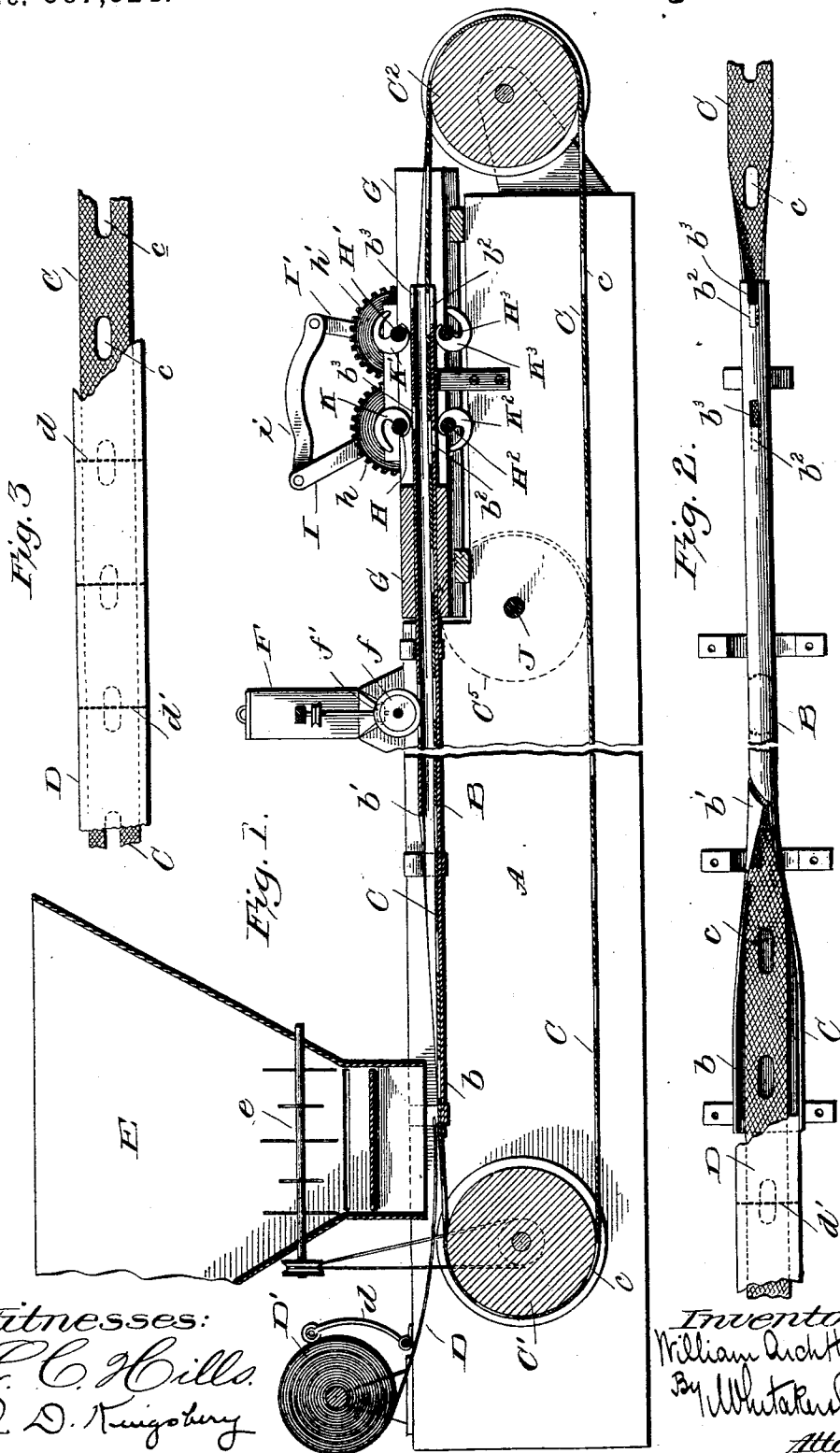
3 Sheets—Sheet 1.

W. A. HUDSON.

PROCESS OF MAKING CIGARETTES AND APPARATUS THEREFOR.

No. 587,824.

Patented Aug. 10, 1897.



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Fig. 4.

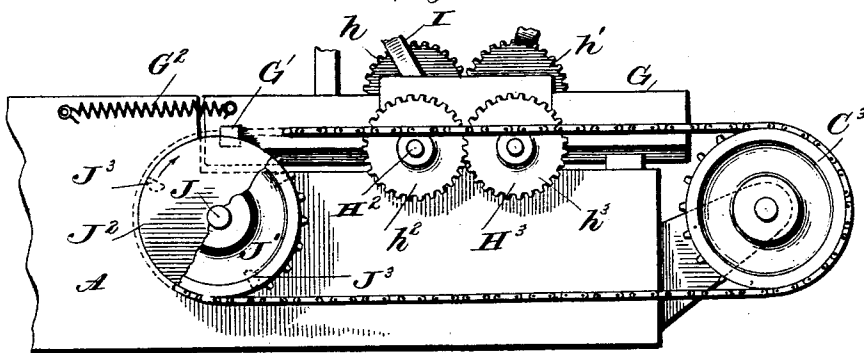


Fig. 5.

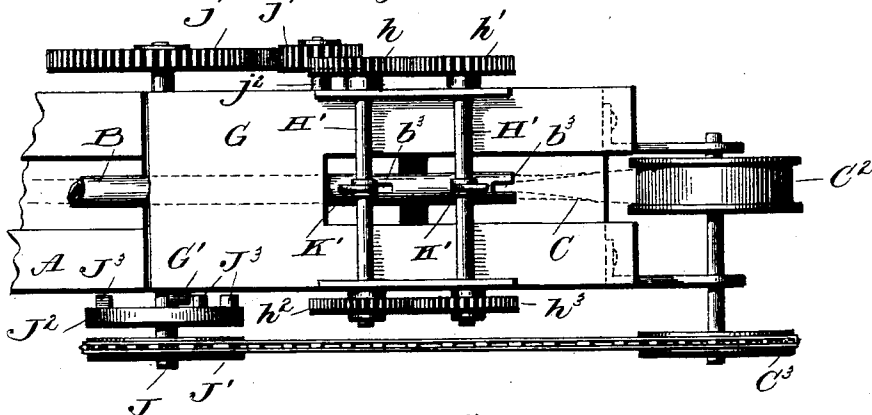
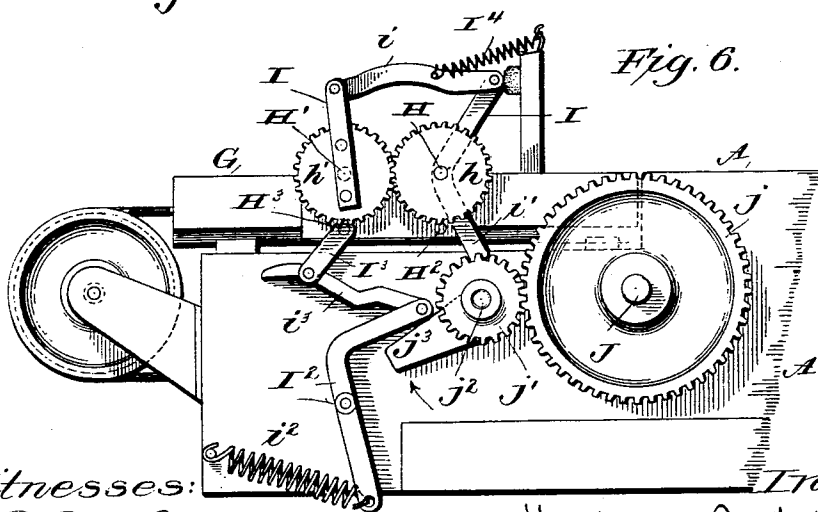


Fig. 6.



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3 Sheets—Sheet 3.

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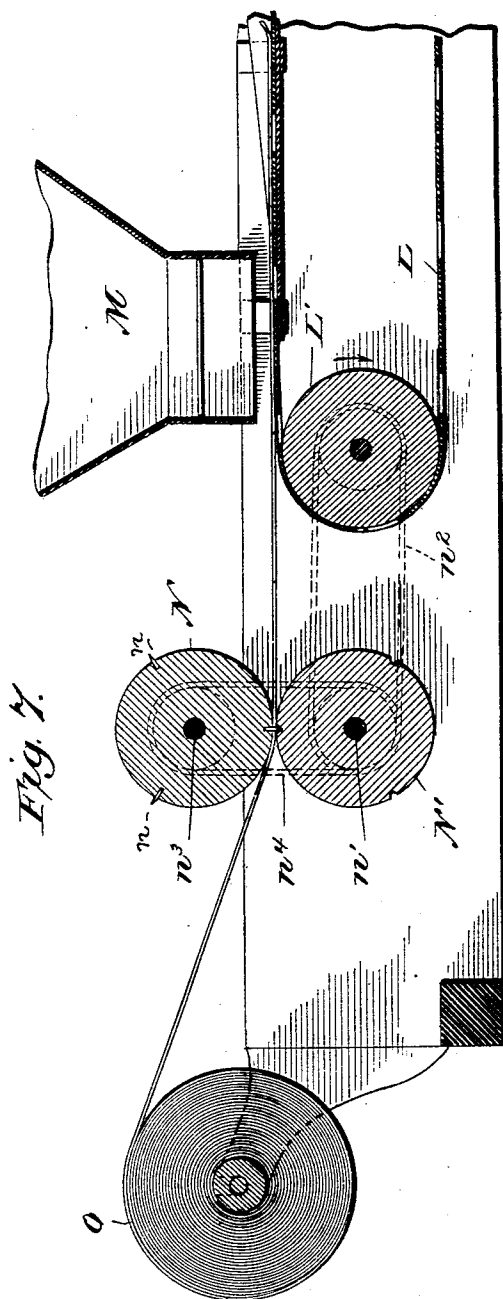


Fig. 4.

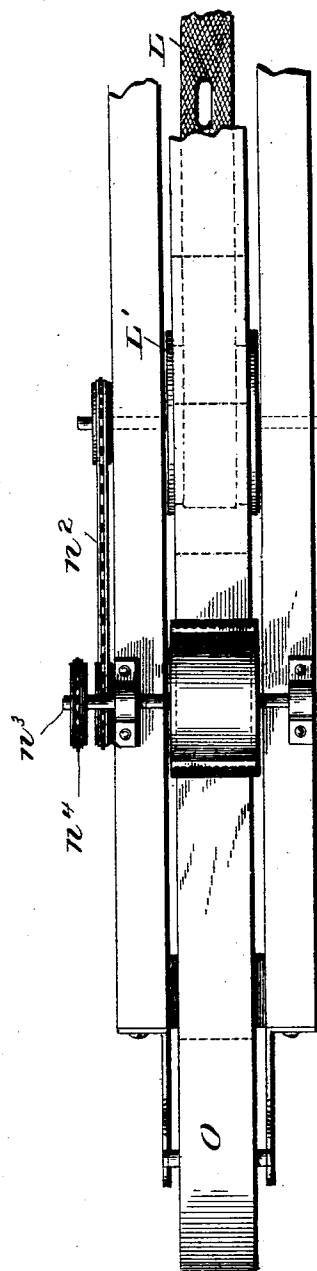


Fig. 8.

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UNITED STATES PATENT OFFICE.

WILLIAM A. HUDSON, OF WASHINGTON, DISTRICT OF COLUMBIA.

PROCESS OF MAKING CIGARETTES AND APPARATUS THEREFOR.

SPECIFICATION forming part of Letters Patent No. 587,824, dated August 10, 1897.

Application filed January 10, 1896. Renewed December 22, 1896. Serial No. 616,684. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. HUDSON, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Processes of Making Cigarettes and Apparatus Therefor; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention consists in the novel process and in the novel features of construction and combination of parts hereinafter fully described, reference being had to the accompanying drawings, which illustrate one form in which I have contemplated embodying my invention, and said invention is fully disclosed in the following description and claims.

Referring to the said drawings, Figure 1 represents a longitudinal sectional view of a machine embodying my invention. Fig. 2 is a top plan view of the cigarette-forming tube, showing the slotted forming-belt and the perforated paper. Fig. 3 represents a detail view of a portion of the belt and wrapper. Fig. 4 is a side elevation of a portion of the machine adjacent to the tucking devices. Fig. 5 is a top plan view of the same. Fig. 6 is a side elevation of the same, taken from the side opposite that shown in Fig. 4. Fig. 7 is a sectional view of the rear portion of the machine, showing a device for perforating the paper web applied thereto. Fig. 8 is a top plan view of the same.

In the drawings, A represents the main frame of a cigarette-machine embodying my invention formed, preferably, of two side pieces. Between the side pieces of the frame and extending longitudinally thereof is the forming-tube B, which is supported by means of suitable brackets or hangers from the side frames. This tube is shown in detail in Fig. 2 and consists for a portion of its length of a cylindrical tube, its rear portion being open and gradually flattened, as shown at *b*, and provided adjacent to said flattened portion with the usual folding-lip *b'* for turning one edge of the paper under the other.

C represents the folding and carrying belt,

which is supported in this instance upon suitable grooved rollers *C'* *C*², supported in the main frame, adjacent to opposite ends of the same, the upper side of said belt passing through the forming-tube. The belt C is of such a width that when folded around the cigarette-stem in the forming-tube its edges will be far enough apart to permit the upper tucking-fingers, hereinafter described, to pass between them, and in order to allow the lower tucking-fingers to engage the cigarette I provide the belt C with a series of elongated openings *c*, disposed centrally thereof and at such a space apart that the distance between the centers of adjacent openings *c* will be equal to the length of a cigarette before tucking. Any suitable form of tightening mechanism (not shown) may be employed to hold the belt taut on its supporting-rolls.

D represents the paper strip, which is preferably drawn from a roll *D'*, supported at the rear end of the main frame and provided with a suitable spring-actuated tension device *d* or other preferred form of tension, as desired. The paper strip, as shown in Figs. 2 and 3, is perforated transversely at intervals, as indicated at *d*, so that the portions between adjacent perforations will be exactly the correct length for a cigarette, and when the paper is introduced into the machine care must be taken that each row of perforations lies across the center of one of the apertures in the belt, as shown in Figs 2 and 3.

The paper is led into the machine from the roll *D'* adjacent to the rear belt-roller *C'* and above the path of the paper, and above the flattened open end of the forming-tube I locate the tobacco-feeding hopper *E*, having a suitable stirrer *e*, and a contracted delivery-mouth which delivers tobacco upon the paper in a narrow stream sufficient to form a continuous cigarette-stem. When the belt is in motion, the paper will be drawn into the forming-tube and folded about the tobacco to form a continuous stem. If it is desirable, the paper wrapper may be pasted while it is passing through the tube B, and in Fig. 1 I have shown a paste-wheel *f* extending into the slotted portion of the tube B, between the edges of the belt and engag-

ing the overlapping edge of the wrapper and supplied with paste by a small horizontal roll f' from a paste-receptacle F, supported on the main frame. I do not limit myself, however, to any particular form of pasting mechanism, and the paste mechanism may be dispensed with altogether, if desired.

Adjacent to the front end of the forming-tube B are the tucking devices, which tuck the ends of the cigarette-wrapper, and in the act of tucking sever the paper along the lines of its perforations, thus separating the stem into individual cigarettes without the use of a knife or cutter. The tucking mechanism is carried by a movable sliding carriage G, supported by the side pieces of the main frame and preferably connected thereto by a dovetailed construction, the side pieces of the frame being cut away to receive the sliding carriage, as shown. Above the sliding carriage and supported thereby are the upper tucker-shafts H and H', extending transversely across the machine and connected for joint movement in opposite directions by intermeshing gears h and h' , mounted upon said shafts H and H', respectively. (See Figs. 4, 5, and 6.) Directly beneath the shafts H and H' are corresponding shafts H² and H³, respectively, also connected for joint motion in opposite directions by gears h^2 and h^3 , which for convenience are located on the opposite side of the carriage from the gears h and h' .

An operating-lever I is mounted pivotally upon the shaft H and is connected by a link i with an arm I', rigidly connected with the shaft H', for moving the upper tucking devices, and the said operating-lever I is also provided with a downwardly-extending arm i' , adapted to be engaged by a suitable operating means. The shaft H³ is provided with an operating-arm I³. In this instance I have shown a lever I² pivoted to the main frame and having a part in position to be engaged by the tucker-operating device, said lever having one end connected with the arm I³ by a link i^3 , and its other end connected with a retracting-spring i^2 , secured to the main frame.

J represents the main driving-shaft of the machine, which is rotated by a belt-pulley from any suitable source of power and is provided with a gear-wheel j , (see Fig. 6,) which meshes with and drives a pinion j' on a short shaft j^2 , on which is secured a tucker-operating arm or cam j^3 . This cam j^3 rotates in the direction indicated by the arrow, and first engages the lever I², thereby moving the arm I³ and the lower-tucker shafts, and after passing the lever I² the said cam j^3 strikes the depending arm i' of the lever I, thereby operating the upper-tucker shafts. The upper-tucker shafts are drawn back into their normal positions after the cam j^3 passes the arm I' of lever I by a suitable spring I⁴, connected in this instance with the link i ,

thereby drawing the lever I back against a buffer or cushion I⁴, which is used to relieve the jar.

The tuckers are shown best in Fig. 1, and consist of the upper tuckers K and K', mounted, respectively, on the shafts H and H', and the lower tuckers K² and K³, similarly mounted on the shafts H² and H³. These tuckers consist of curved arms which when their shafts are turned are forced into the opposite ends of the cigarette, turning in a portion of the paper and forcing it into the end of the cigarette. As before described, the lower tuckers are operated first by the cam j^3 to make the first part of the tuck, after which the upper tuckers complete the tucking of the ends of the cigarette, as will be readily understood.

As the belt is moved forward continuously, it is obvious that the tucking mechanism must also be moved forward during the tucking operation at the same speed as the cigarette-stem, so as to avoid retarding the progress of the stem and belt. This is accomplished by means of mechanism best shown in Figs. 4 and 5. On the driving-shaft J is a sprocket-wheel J', which drives a sprocket-wheel C³ on the shaft which supports the belt-roller C², thereby driving the belt-roller and belt at the same speed as the driving-shaft. On the driving-shaft J, I also secure a cam-disk J², (see Figs. 4 and 5,) provided with a series of studs or cams J³—in this instance three in number—located in a circle about the shaft J, equal in diameter to the diameter of the belt driving roller C², so that the movement of the cams or studs will be equal to the travel of the belt, and said studs are located a distance apart exactly corresponding to the distance between adjacent lines of perforations of the paper. These studs or cams J³ engage a lug or projection G' on the movable carriage G and move said carriage forward during the tucking operation at the same speed as the travel of the cigarette-stem and its carrying-belt C, thus enabling the tuckers to operate upon the stem without moving longitudinally with respect thereto. In order to allow the tuckers to engage the stem, the tube B is provided with slots b^2 b^2 on its lower side to allow the lower tuckers to enter the tube, pass through the openings in the belt, which will at that moment register with said slots, and tuck the cigarette. The upper side of the tube is also provided with similar slots b^3 b^3 in advance of the slots b^2 b^2 , as the upper tuckers are operated after the lower ones and will enter the tube farther along the same by reason of the movement imparted to the carriage G by the studs J³, as previously described. As soon as the tucking operation is completed the carriage G is drawn back to its normal position by suitable springs G² and remains motionless until the stem has been fed forward by the belt, so as to bring the length of another

cigarette in position in the tube to be tucked, when the tucking operation will be repeated. It will be seen that at each tucking operation the rear tuckers will tear the paper along the line of perforations and separate the cigarette to be tucked from the stem and tuck the ends of the same, after which the continued forward movement of the stem will eject the tucked and completed cigarette from the tube.

If it is desired, I may dispense with the use of a perforated belt, such as is shown in the drawings, and employ a plain belt, in which case the belt will not extend entirely through the tube, but will leave the tube before it reaches the tucking devices and will pass around a suitable driving-roller C⁵ on the driving-shaft, as indicated in dotted lines in Fig. 1.

By employing the perforated paper herein shown and described I dispense entirely with a knife for severing the stem into individual cigarettes and thereby greatly lessen the cost of the machine and increase the ease and speed of running it. By doing away with the knife an expensive element which required very accurate and perfect adjustment and constant care in the use of the machine is eliminated and better results are obtained without it.

In order to supply perforated paper to the machine, I may use a paper web which has been previously perforated, as is indicated in Figs. 1 to 6, inclusive, or I may provide the machine itself with a perforating mechanism interposed between the belt and a roll of plain unperforated paper, as shown in Figs. 7 and 8, and perforate the paper as it passes through the machine. In these figures, in which L indicates the belt, L' the rear belt-carrying roller, and M the hopper, N designates a perforating-roller, which is provided in this instance with three knives or blades *n*, provided with serrated cutting edges and separated upon the periphery of the wheel distances equal to the desired length of the cigarette-wrappers before tucking. Beneath the perforator N is a roll N', provided with depressions or recesses to accommodate the knives *n*. This roller N' supports the paper and coöperates with the perforating-roller in its operation. O represents the roll of paper supported at the rear end of the main frame of the machine.

I prefer to drive positively both of the rollers N and N', and in this instance I have shown the shaft *n'* of roller N' provided with a sprocket-wheel and driven by a chain *n*² from a similar sprocket-wheel on the shaft of the belt-roll L'. The shaft *n'* of roller N' is then geared to move with the shaft *n*³ of roller N by a sprocket-chain *n*⁴, so that the two rollers N and N' move simultaneously and in opposite directions, as required to produce the desired result. By this construction it

will be seen that plain unperforated paper can be employed and perforated as it is drawn into the machine.

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.

What I claim, and desire to secure by Letters Patent, is—

1. The process of making cigarettes, which consists in folding a continuous paper wrapper perforated transversely at intervals, around a tobacco filler, then tearing the paper apart on a line of perforations and then tucking the ends of the severed cigarette, substantially as described.

2. The process of making cigarettes which consists in folding a continuous paper wrapper, perforated transversely at intervals, around a tobacco filler, then pasting the wrapper, then tearing the paper apart on a line of perforations, and then tucking the ends of the severed cigarette, substantially as described.

3. The process of continuously making cigarettes which consists in wrapping a continuous paper wrapper, perforated transversely at intervals, around a tobacco filler to form a continuous stem, then continuously separating said continuous stem into individual cigarettes by breaking the wrapper apart along a line of perforations, substantially as described.

4. In a cigarette-machine the combination with the forming-tube, of the perforated belt for carrying the tobacco and wrapper through said tube, and the devices for tucking the ends of the cigarettes having parts adapted to extend through the perforations of said belt, substantially as described.

5. In a cigarette-machine the stem forming and carrying belt, provided with perforations located at intervals, for the purpose set forth, the centers of adjacent perforations being a distance apart equal to the length of a cigarette before tucking, substantially as described.

6. In a cigarette-machine the combination with devices for forming a continuous tobacco filler, devices for feeding a continuous paper wrapper and folding it around said filler, and the tucking devices, of a perforating mechanism located in the path of the continuous paper wrapper substantially as described.

7. The process of continuously making cigarettes which consists in wrapping a continuous paper wrapper, weakened transversely at intervals, around a tobacco filler, to form a continuous stem, then continuously separating said continuous stem into individual cigarettes by breaking the wrapper apart along

one of said weakened portions, substantially as described.

5 8. The process of continuously making cigarettes which consists in weakening the continuous paper wrapper transversely at intervals, forming a tobacco filler and wrapping the paper wrapper around the same, then continuously separating said continuous stem into individual cigarettes by breaking the

wrapper apart along one of said weakened portions, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM A. HUDSON.

Witnesses:

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J. D. KINGSBERRY.