

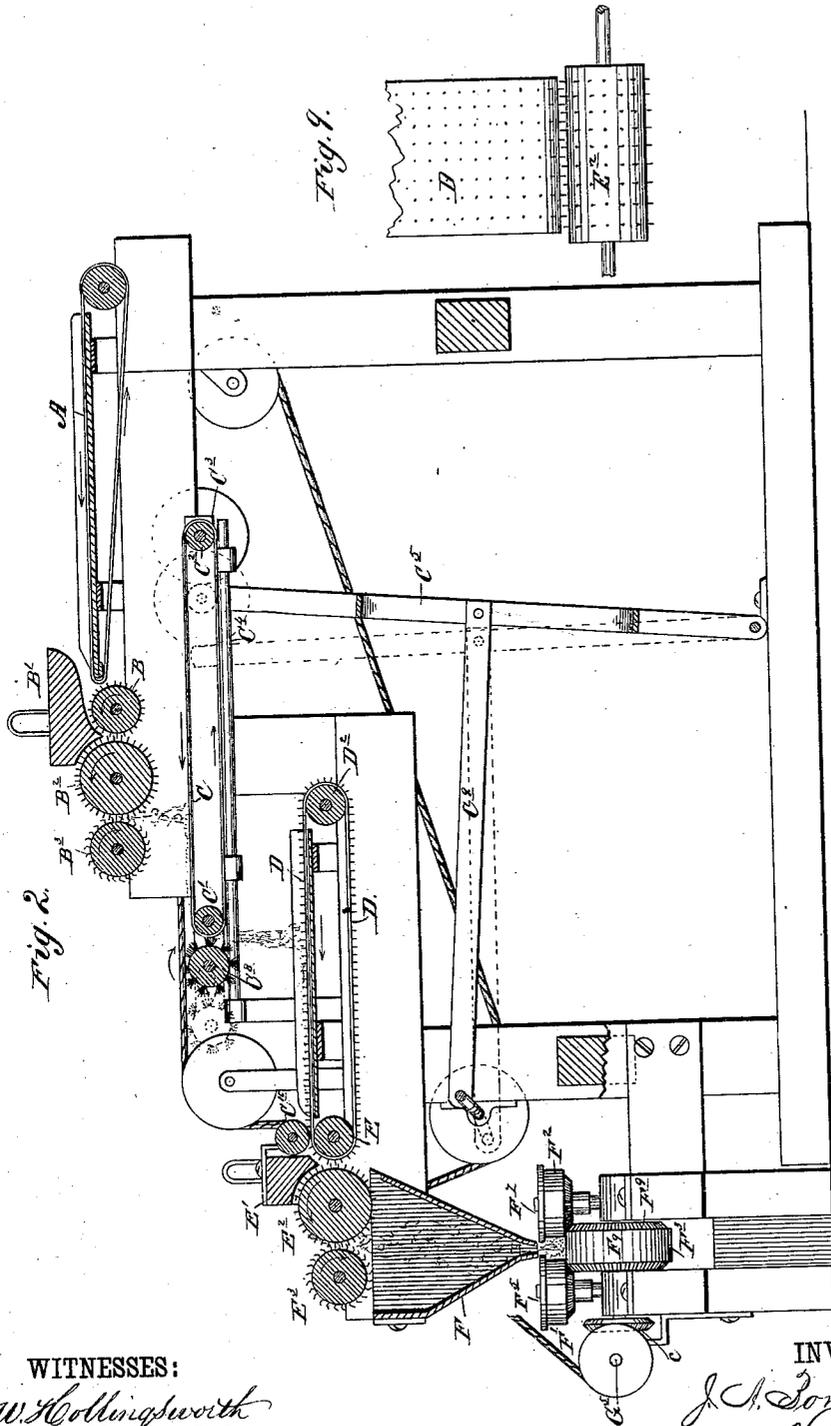
(No Model.)

3 Sheets—Sheet 2.

J. A. BONSACK.
CIGARETTE MACHINE.

No. 247,795.

Patented Oct. 4, 1881.



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CIGARETTE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 247,795, dated October 4, 1881.

Application filed June 21, 1881. (No model.)

To all whom it may concern:

Be it known that I, JAMES ALBERT BONSAK, of Bonsak's, in the county of Roanoke and State of Virginia, have invented a new and Improved Cigarette-Machine; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

10 Figure 1 is a front elevation of the machine, partly in section. Fig. 2 is a vertical section through the line *x x* of Fig. 1, looking in the direction of the arrow. Fig. 3 is a plan view of the devices for forming the cigarette roll or filler. Figs. 4 and 5 are enlarged vertical cross-sections of the same through the lines *y y* and *z z* respectively, looking in the direction of the arrows. Fig. 6 is an end view of the machine, showing devices for cutting off the cigarette; 15 Fig. 7, a plan view of these devices; Fig. 8, a side view of the same, looking in the direction of the arrow in Fig. 7; and Fig. 9, a view showing the alternating arrangement of teeth in the rolls and belt.

25 My invention relates to certain improvements upon the cigarette-machine for which Letters Patent of the United States were granted me March 8, 1881, No. 238,640. This machine operated on the general principle of forming the shredded tobacco first into a continuous roll or filler, then wrapping a continuous strip of paper longitudinally around this filler, then pasting its meeting edges, and finally cutting this continuous cigarette into definite lengths and counting them. For this purpose said machine comprised a combination of a concave with rollers covered with card-cloth, and also a reciprocating belt for distributing and spreading the tobacco for a uniform and homogeneous 40 feed; also, in a peculiarly-constructed tapering tube, having an endless belt passing through it which received the tobacco, and was curled up longitudinally as it passed through the tube to form a filler, and which filler was then delivered to another endless belt, which carried the filler and a strip of paper through another peculiar tube that wrapped the paper around the filler and held it while being pasted.

45 My present invention consists, principally, in means for insuring the more uniform passage of the tobacco under the concaves; in a brush

mounted upon the frame of and combined with the reciprocating spreading belt for positively clearing it of the tobacco shreds, which have a tendency to adhere and interfere with the 55 uniformity of the spreading and distributing action; also, in a presser-roller for co-operating with the concaves, and a toothed belt to prevent the tobacco from piling up in front of said concave. 60

It also consists in the novel construction and arrangement of the filler-forming devices, for which purpose I use three steel belts, which are arranged to form a converging trough, and all travel in the same direction and co-operate 65 with a wheel which presses the filler into an approximately square shape.

The invention also further consists in the improved means for cutting off the cigarette-roll into definite lengths, all as will be herein- 70 after more fully described.

In the general construction of my improved machine the tobacco feeding and distributing devices are arranged, as in my prior patent, so that the travel of the stock in these devices 75 is at right angles to the travel of the stock in the filler-forming and paper-wrapping and pasting devices. Thus Fig. 2 is a vertical longitudinal section of the tobacco feeding and distributing devices, and Fig. 1 shows an end 80 view of the same with the filler-forming and paper-wrapping devices extending therefrom in side view.

In the drawings, (see Fig. 2.) A represents the first endless belt upon which the tobacco 85 is spread by hand.

B is the feed-roller which carries the tobacco under the concave B'.

B² is the distributing roller, and B³ is a strip- 90 ping-roller which takes off the tobacco from B² and throws it down upon the endless spreading-belt C. This belt C is distended about rollers C' C², and these rollers are mounted upon a frame, C³, which slides horizontally on guide-rods C⁴ from the action of a rocking arm, 95 C⁵, and connecting-rod C⁶, so that while the belt travels in its endless circuit it also distributes or spreads (as shown by dotted lines) the tobacco on another subjacent belt, D, so that the tobacco does not fall on the latter in 100 piles, all as fully described in my prior patent. The belt D passes around rollers E D², and its

upper section is supported by a subjacent table. E' is a second concave; E², a second distributing-roller, and E³ a second stripping-roller, which correspond in their relation and function to B' B² B³. These last rollers, E² E³, discharge the tobacco into a chute, F, which delivers it to the filler-forming devices, which I will hereinafter describe.

As so far described, my improved machine does not differ materially from the corresponding construction in my prior patent. I will now proceed to describe the improvements which I have made.

I found in the old device that with plain rollers B and E underneath the concaves the tobacco would at times fail to pass under the concave, but would pile up in front of the same until the increased friction of a larger bulk compelled it to enter, when it would pass to the distributing-roller in a lump which could not be sufficiently distributed by the subsequent operation. To obviate this I cover the surface of the first roller beneath the concave with a series of teeth, which may be permanently located on the roller, as at B, or which may be located on the belt D, that passes around the roller, as shown at E. In either case the concave bears against the teeth projecting from the round surface of the roller, and the teeth or pins positively carry the tobacco beneath the concave as fast as it is fed to the same by the belt, and does not allow any tobacco to hang back or pile up in front of the concave.

At the upper concave I prefer to make the teeth directly on the roller B, so as to avoid teeth on belt A, which would be liable to prick the hand of the feeder, while at the lower concave I prefer to use a plain roller, E, and place the teeth on the belt D, that passes around the same.

Instead of using card-cloth teeth on the distributing-rollers B² and E², as in my prior patent, I also prefer to use larger and straight well-defined teeth, which are arranged in parallel rows around the cylinder about three-eighths of an inch apart, and which rows of teeth alternate with the rows of teeth on the roll B or belt D. (See Fig. 9.) Such arrangement of teeth I find effects a more perfect transfer of tobacco from one surface to the other.

As the belt C reciprocates over D to spread the tobacco on the latter, I have found that small particles of tobacco will adhere to belt C, and instead of dropping off at the end of this belt C they pass around with it, dropping tobacco through the machine, and also interfering with the regularity of the feed. To correct this I mount a rotary brush, C³, in bearings in the end of the frame next to the delivery end of belt C, to which brush is imparted a rotary motion in the direction of the arrow, so that its action is to positively clear the belt C of all tobacco in a uniform and regular manner, which brush thus co-operates with the reciprocating belt in securing an even and uniform delivery of the

tobacco to the belt D. This brush reciprocates with the frame of the endless belt C, and is to be rotated by a short band connecting with a pulley on the nearest roller, C'. Where the tobacco drops upon the toothed belt D, I have found that the masses will sometimes be sustained upon the tops of the teeth, and when such a clot reaches the concave it is not positively drawn under the same by the teeth, as it should be. To provide for this I place just over the roller E and beside the concave E' a presser-roller, C¹⁰, which bears upon the teeth of the belt D and forces the tobacco well down between the said teeth, so as to cause the latter to positively carry the same into the concave.

I will now proceed to describe the devices for forming the evenly-distributed tobacco into a filler before receiving its wrapper.

As the tobacco is stripped from the roller E² it falls into the chute F, and passes in a thin sheet through a slit in the bottom of said chute into a trough composed of three metal belts, F' F² F³. (See Figs. 3, 4, and 5.) This trough is arranged immediately beneath the elongated opening in the bottom of chute F, and it extends at right angles to the general direction of the feeding and distributing devices shown in Fig. 2. The belt F' is distended about two horizontal pulleys, F⁴ F⁵, which have flanges at their upper edges to hold the belt down, while F² is distended about corresponding horizontal pulleys F⁶ F⁷, similarly equipped with flanges. The belt F³ passes around two vertical pulleys, F⁸ F⁹. The adjacent sides of the two belts F' F² form the two vertical walls of the trough, while the upper side of belt F³ forms the bottom of said trough. Backing-strips of wood G G' are placed on the outer sides of those sections of the belt that form the trough, and re-enforce the trough so as to make its walls unyielding as against pressure from within. These strips also serve to guide the belts and distend them to the proper shape. Thus they cause the belts F' F² to converge from pulleys F⁵ and F⁷ to a point, a, Fig. 3, then run parallel for a short distance, and thence diverge to the pulleys F⁴ and F⁶. The two belts F' F² are guided by the flanges of the pulleys at the top and the belt F³ at the bottom, (see Figs. 4 and 5,) and the belt F³ is guided by metal strips b b, inserted between the backing-strips G and G'.

At the point a, where the two sides of the trough are parallel, a disk or wheel, H², is arranged, which wheel exactly fits between the sides of the trough, and has a straight or square periphery that forces the tobacco down to cause it to be compressed into an approximately square filler. This disk or wheel H² is mounted in bearings above the trough, and it rotates passively by the feeding of the tobacco underneath of the same. Instead of using this disk or wheel for this purpose, I may use a short supplemental belt with a roller on the top of it; or I may simply employ a spring-finger for

pressing down the tobacco. As the tobacco falls into this trough it is carried along by the movement of the steel belts forming such trough, which tobacco is gradually compressed by the convergence of the trough and the action of the disk H^2 to form a continuous filler, x^3 , Fig. 1. For giving motion to these two belts I form the pulleys F^5 and F^7 with bevel-teeth on their lower edges, (see Figs. 2 and 3.) and these I make to engage with bevel-teeth on the opposite sides of the pulley F^9 , carrying the lower belt, F^3 , so that all of these steel belts travel with the same rate of speed. Instead of gearing these belts to be driven at the wide end of the trough, as shown, they may be arranged to be driven from the narrow end by substantially the same mechanism. The pulley F^9 is arranged upon a shaft that derives motion from long shaft G^5 , through a bevel-gear, c , Figs. 1 and 3. As the filler or compressed line of tobacco issues from the end of the steel-belt trough, as at x^3 , Fig. 1, it is delivered upon the strip of paper L , and with the paper is carried by endless belt G^2 through the wrapping-tube G^3 , where it is operated upon by the paste-wheel G^4 , which is supplied with paste through devices G^6 , just as is described in my prior patent.

With respect to this feature of my invention which I have just described, I would state that I am aware that three endless belts have heretofore been used as a feeding-trough in a cigar-machine, and that backing-strips have also been used behind the belts.

My invention consists in making the trough a convergent trough for compressing the tobacco and providing a pressing-disk or other device operating in the open side of the trough at the point of greatest convergence to complete the formation of a filler.

My invention is also distinctive in making the backing-strips with double inclines, which distend the belts so that in a portion of their travel they are convergent, and during the other portion where the pressing-disk acts between them they are parallel. I also consider my mode of gearing the three belts together for equal and uniform travel a meritorious feature.

For cutting the cigarette into definite lengths I give to the cutting devices a secondary movement in the same direction with the cigarette as it emerges from the machine. The object of this is as follows: When the machine is in rapid action the cigarette emerges at quite a rapid rate, and in the interval in which it is being cut into lengths it is practically stopped at its cut end in its progressive movement, but is still feeding from the machine, and this has a tendency to double up the cigarette-roll and burst open the freshly-pasted edges. This is entirely overcome by giving to the cutting device while in cutting action a movement along with the cigarette. I will now proceed to describe particularly the devices for accomplishing this result.

Just to one side of the end of the wrapping

and pasting belt from which the cigarette comes is arranged a shaft, d , (see Fig. 7,) carrying at one end a pulley, e , and at the other end a cutting-disk, f . The pulley e of the shaft is connected by belts and pulley g with a pulley on the long shaft G^5 , through which a rapid rotary action is given to the cutting disk or knife.

In line with the cigarette and encompassing the same is a tubular holder, h , carried upon the top of arm i , which is pivoted at its lower end, and carries also an inverted-U-shaped piece, j , which acts as a guard or holder for the cigarette that is being cut off. The tubular holder h passes on one side of the cutting-disk and the guard j on the other. Heretofore the cigarette has been cut off by moving the knife against the cigarette, which necessitates a quick movement of a heavy and cumbersome mechanism. Instead of moving the knife to the cigarette I bring the cigarette to the knife by projecting the holder h toward the disk, as shown in dotted lines, Fig. 6. For this purpose a bar, l , is pivoted at its top, and has two branches at its lower end, one of which has a slotted connection with the arm i , carrying the cigarette-holder, and the other of whose branches is operated upon by a cam, m , (see Fig. 7,) on the long shaft G^5 to project the cigarette and its holder toward the knife, the said holder being in turn withdrawn by a spring, n , acting on bar i . Now, to cause the knife to have a movement in line with the cigarette while it is being cut, the rotary knife, its shaft, the cigarette-holder, and its moving arms are all mounted upon a movable or sliding carriage, O , (see Figs. 8 and 7,) which rests upon the main frame and slides back and forth in line with the travel of the cigarette. This carriage is drawn back by a spring, P , and when the knife is cutting is moved forward, as shown in dotted lines, by a cam, q , on the end of the shaft G^5 , which bears against a projection, r , on the carriage O , and throws it out at the proper time.

It will be seen that I have not described any particular frame-work for carrying the parts of my machine, nor any particular belt or gearing connections for giving the proper motion to the several movable parts. These may be varied at will, and can easily be supplied by the mechanic to suit the conditions of the case.

Having thus described my invention, what I claim as new is—

1. In a cigarette-machine, the combination, with a toothed distributing-roller and a double concave, of a roller, located at the entering side of the concave, and having teeth upon its periphery which co-operate with the concave for feeding the stock to the distributing-roller and preventing it from piling up on the outside, as set forth.

2. The combination, with the endless spreading-belt C and its reciprocating frame or carriage, of a rotary brush, C^8 , located at the delivery end of said belt and mounted upon its

carrying-frame, so as to reciprocate with it, as described.

3. The combination, with the distributing toothed roller E², the concave E', and roller E, of the toothed belt D, passing around the roller E, between the same and the concave, substantially as and for the purpose described.

4. The combination, with the toothed roller E², concave E', the roller E, and the toothed belt D, passing around roller E, as described, of a presser-roller, C¹⁰, for forcing the tobacco down between the teeth of the belt before passing beneath the concave, as described.

5. A device for forming a continuous cigarette-filler, consisting of three endless belts, two of which are arranged convergently to form a tapered trough, as described, and a pressing device acting in the open side of the trough at the point of greatest convergence, all combined substantially as and for the purpose described.

6. The combination, with the three endless belts, of the backing-strips G' G', having their opposing faces at one end arranged parallel to receive the pressing-disk, and their opposing faces at the other end arranged convergently to effect the compression of the tobacco, substantially as and for the purpose described.

7. The combination, with three endless belts arranged to form a trough, as described, of the two active pulleys F⁵ F⁷, distending the side belts, and the active pulley F⁹, distending the bottom belt, and geared by bevel-teeth directly to the two pulleys F⁵ F⁷, for equal movement for the three belts, substantially as described.

8. The combination, with the rotary cutting-disk, the carriage carrying the same, and means for moving the carriage parallel to the feed of the cigarette, of a holder for the cigarette mounted upon the same carriage, and means for projecting said holder and the cigarette toward the relatively stationary cutting-disk, substantially as and for the purpose described.

9. The combination, with the rotary cutting-disk, maintained at a constant distance from the line of feed of the cigarette, of a holder for the cigarette, and mechanism, substantially as described, for projecting said holder and cigarette toward the cutting-disk to cut the cigarettes into lengths, substantially as described.

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Witnesses:

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CHAS. A. PETTIT.