

No. 633,946.

Patented Sept. 26, 1899.

J. S. BEEMAN.

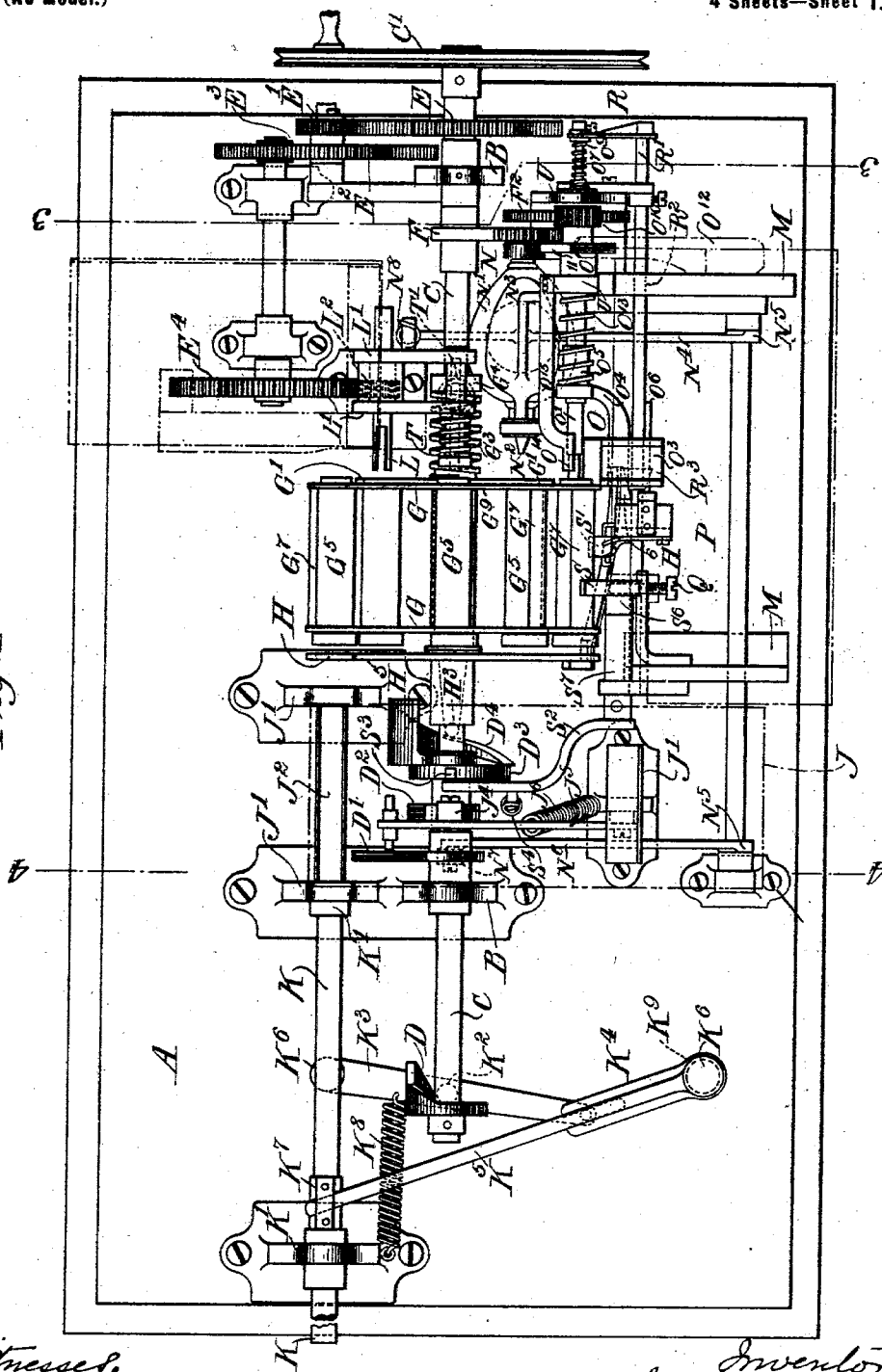
MACHINE FOR INSERTING CIGARETTE MOUTHPIECES.

(Application filed May 17, 1898.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1



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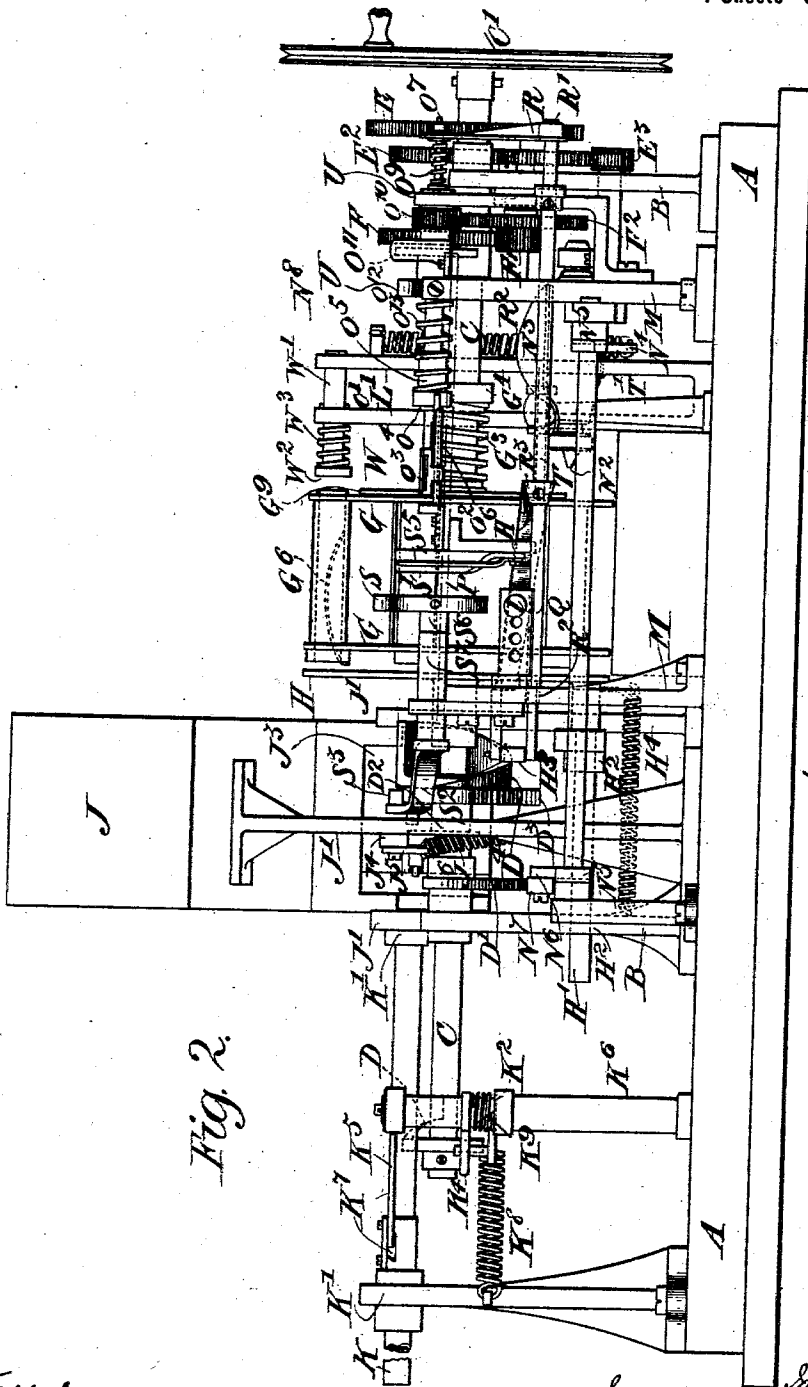
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Fig. 3.

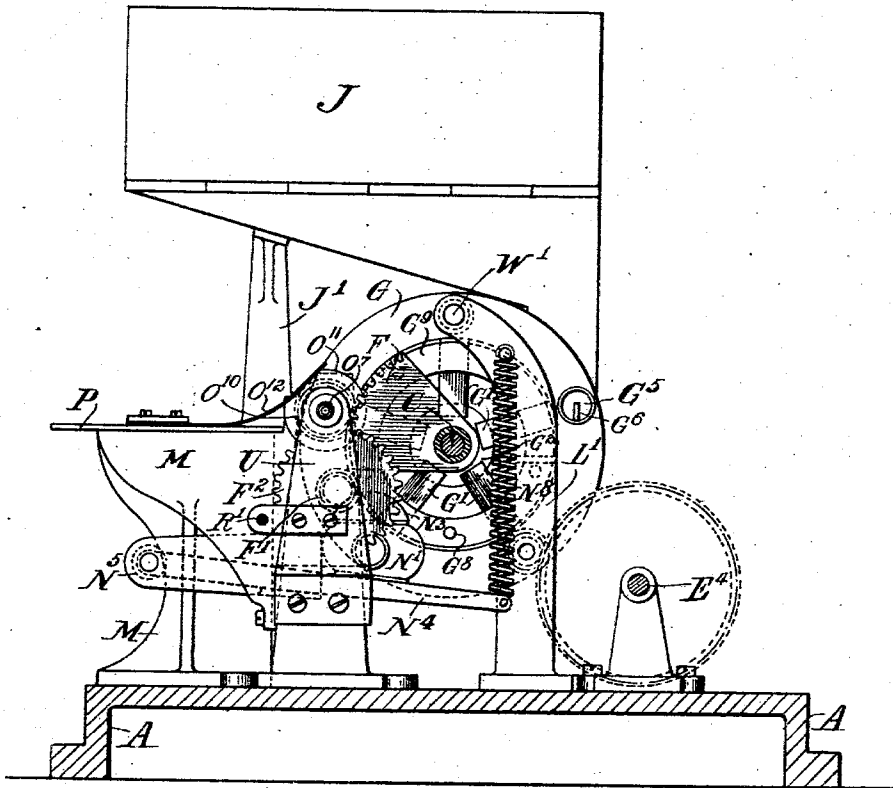


Fig. 6



Fig. 7



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Fig. 4

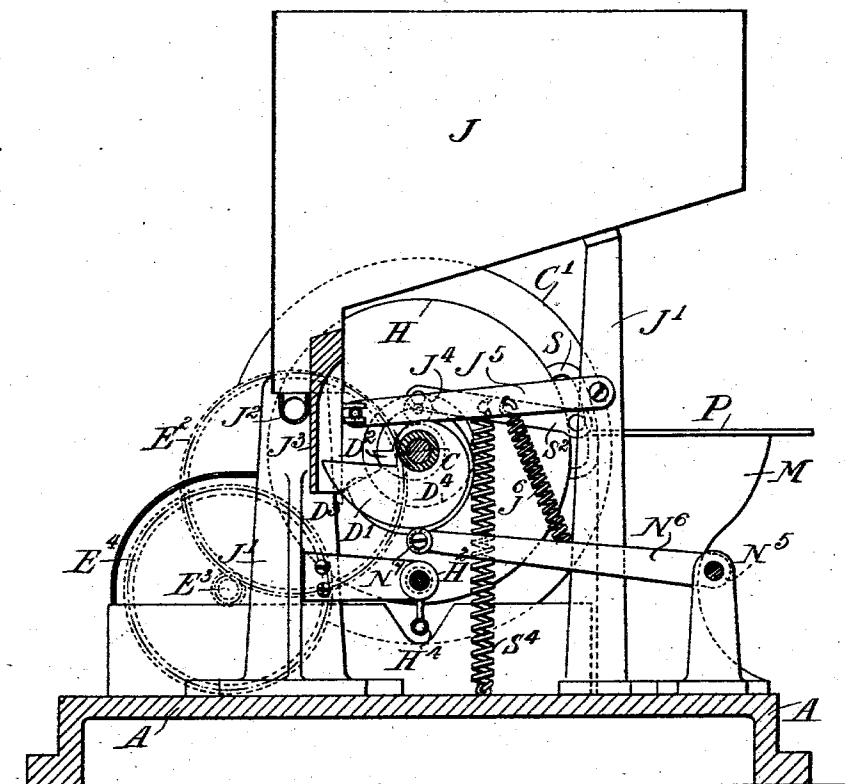
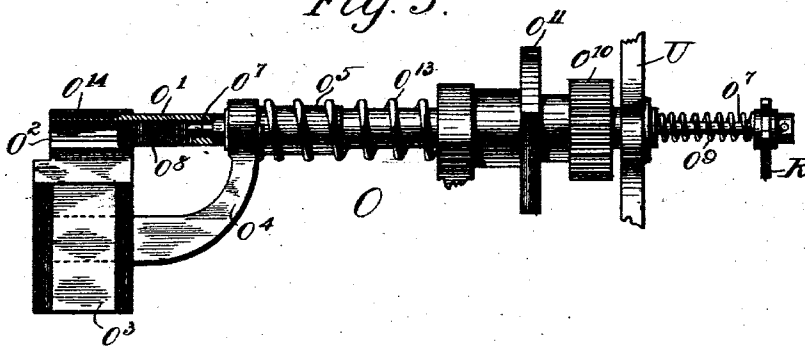


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOSEPH SAMUEL BEEMAN, OF LONDON, ENGLAND.

MACHINE FOR INSERTING CIGARETTE-MOUTHPIECES.

SPECIFICATION forming part of Letters Patent No. 633,946, dated September 26, 1899.

Application filed May 17, 1898. Serial No. 680,949. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH SAMUEL BEEMAN, a subject of the Queen of England, residing at London, England, have invented certain new and useful Improvements in Machines for Inserting Cigarette-Mouthpieces, (for which I have made application for Letters Patent in Great Britain, No. 9,961, dated April 30, 1898,) of which the following is a specification.

This invention relates to machines for providing cigarettes with a reinforcement or mouth end, and has for its object the construction of a machine which will remove the tobacco from one end of a cigarette and insert in lieu thereof paper, cork, or other material, thus forming a reinforcement or mouth end in the cigarette, which enables it to be used without a separate mouthpiece or holder.

Machines made according to this invention comprise a cigarette-holder so constructed that it grips the cigarette under treatment, a drill, borer, "breaker" or equivalent device for breaking up the tobacco in one end of the cigarette, and an "insertor" or other apparatus by which the reinforcement of paper or other material is held and inserted into the prepared end of the cigarette.

The cigarette-holder and the breaker are caused to move relatively, so that the latter enters the end of the cigarette, and thus the desired amount of tobacco is broken up and removed or broken up for removal in any convenient way. The cigarette may then be brought under the action of a blower or similar device, which removes any broken tobacco that may have been left by the breaker. The reinforcement is now placed in the drilled end of the cigarette by the insertor or equivalent device, which may, if desired, be supplied with the material in strips and roll it up previously to inserting it. The cigarette is finally ejected from the holder and another substituted for it; but previously to this it is convenient to bring the end of the cigarette into contact with a "finisher," comprising a stop or the like, in order that the reinforcement may be pushed quite home.

In the accompanying drawings, which illustrate one construction of apparatus according to this invention, Figure 1 is a plan; Fig.

2, a front elevation; Fig. 3, a vertical section on the line 3 3 of Fig. 1. Fig. 4 is a vertical section on the line 4 4 of Fig. 1. Figs. 5, 6, and 7 show further details of various portions of the apparatus.

Like letters indicate like parts throughout the drawings.

A is a base-plate upon which all stationary portions of the apparatus may be rigidly mounted.

B are standards carrying a shaft C, which can be rotated by means of a pulley C'. The shaft C carries upon it five cams D, D', D², D³, and D⁴, a gear-wheel E, and a toothed quadrant F.

G is a frame or support capable of rotation about the shaft C. It is driven by a friction driving-disk G², (see Fig. 3,) which is joined through an elastic connection, such as the spiral spring G³, to a collar G⁴, fixed upon the shaft C, this arrangement forming a friction-clutch between the support and the shaft. To insure the maintenance of sufficient grip between the face of the disk G² and the contiguous face of the frame or support G, plate radial springs G' are secured to the latter at their outer ends and are arranged to bear at their inner ends on the back of the driving-disk G², Fig. 3.

The rotary support G carries five cigarette-holding tubes G⁵, which are equally spaced around its periphery. Each of the holders G⁵ contains a spring G⁶, which prevents the cigarette from revolving in the holder.

A back plate H is placed upon the shaft C free to reciprocate, but not to revolve, while the shaft revolves independently of it. This back plate is provided with a guide-rod H', moving in guides H². The motion of the back plate is caused by the cam D⁴ upon the shaft C, which acts upon a friction-roller H³, carried by the back plate H. The return of the back plate H is brought about by means of a spring H⁴, one end of which is fastened to the back plate and the other to one of the standards B. A hole H⁵ is formed near the edge of the back plate H. When the back plate H moves forward under the action of the cam D⁴, it causes the rotary frame G to move along the shaft C against the action of the spiral spring G³.

J is a hopper into which the cigarettes under treatment are placed. It is supported on standards J' and is preferably so shaped that the cigarettes tend to gravitate to a trough J². The hopper J is furnished with a vertical slide J³, which reciprocates so as to prevent the cigarettes from sticking and to facilitate their progress to the trough J². The back plate H, previously described, is so mounted upon the shaft C that the hole H⁵ is in line with the trough J². The motion of the slide J³ is caused by the cam D², acting through a friction-roller J⁴ and a lever J⁵. This lever J⁵ is pivoted to one of the standards J', and its return is brought about by the action of a spring J⁶. A plunger K is provided and is mounted in line with the trough J² in suitable guides K', in which it is free to slide. It is operated by the cam D, acting through a friction-roller K² and the pivoted levers K³ K⁴ K⁵, which are supported on standards K⁶. One end of the lever K⁵ moves freely in a sleeve K⁷ upon the plunger K. The return motion of the plunger K is caused by the action of the springs K⁸ and K⁹, which act upon the levers K³ and K⁴, respectively.

L is a breaker carried in bearings L'. It is driven by a pinion L² from the gear-wheel E through intermittent gear-wheels E', E², E³, and E⁴, the diameters of which are so arranged that a very high speed is given to the breaker L.

M are standards forming supports for various other parts of the mechanism hereinbefore described.

N is a blower for removing the tobacco-dust left in the end of the cigarette by the breaker L. It comprises a bulb N', of india-rubber or like material, and a nozzle N². It is supported, as at N³, on one of the standards M. The bulb N' is compressed by the sudden upward movement of a lever N⁴, pivotally mounted, as at N⁵, controlled by a spring N⁶, and operated, through a lever N⁷ and friction-roller N⁸, from the cam D⁷.

An inserter O is also provided for rolling up and inserting strips of paper or other material which form the reinforcement into the ends of the cigarettes. It comprises a tube O', carried in bearings U upon one of the standards M. The tube O' is slotted, as at O², and so arranged that when it is not revolving a portion of the slot O² is in line with a guide O³, through which the slips of paper or the like are inserted. This guide O³ is carried by an arm O⁴, fixed to a sleeve O⁵, which is loosely mounted upon the tube O'. A small rod O⁶, fixed to a plate P, carried by the standards M, serves as an additional support for the guide O³, which slides freely upon it. The rod O⁶ also serves to prevent the guide O³ from revolving when the tube O' rotates. A rod O⁷, furnished with a head O⁸, is placed inside the tube O' and reciprocates therein, the head O⁸ working in the slot O². Its function is to force the roll of paper from

the end of the tube O' into the end of the cigarette. It is joined by a strap R, in the end of which it can rotate, to a rod R', sliding in bearings R² in the standards M. A collar R³, fastened to the rod R', engages with a spring-catch H⁶, carried by the back-plate H, when the latter returns under the influence of the spring H⁴, and thus causes the rod O⁷ to move forward and to detach the roll of paper from the tube O' by means of the head O⁸. An adjusting-screw Q, carried upon one of the standards M, presses against the spring-catch H⁶ and effects the release of the rod R', which returns under the action of a spring O⁹, operating between one of the bearings U and the strap R. A pinion O¹⁰ and disk O¹¹ are mounted upon the tube O' between the bearings U. The pinion O¹⁰ is driven from the toothed quadrant F through the intermediate gear-wheels F' and F². The disk O¹¹ is furnished with a flat, which serves under the action of a spring O¹² to keep the tube O' in such a position that when it is not revolving the slot O² is opposite the guide O³. A finger O¹⁴, carried by an arm O¹³, is provided for the purpose of preventing the free end of the strip of paper from uncoiling after it has been rolled up upon the tube O'. The guide O³ is forced back on the tube O' against the action of a spring O¹³ by the support G during a certain portion of the operation of the apparatus, as hereinafter described, the end of the holder G⁵ passing over the tube O' and finger O¹⁴.

The amount of rotation of the rotary support G is limited by catches S and S', which engage with small plates G⁷, fixed against the cigarette-holders G⁵. The catch S, which may best be understood as to its action by regarding it as the equivalent of the anchor-pallet in a clock-movement, is mounted upon a rod S⁶, carried in a bearing S⁷, and is oscillated through a lever S² and friction-roller S³ by the cam D³, a spring S⁴ keeping the lever S² in contact with the cam D³. The catch S' is a simple detent, which prevents the backward movement of the rotary frame G and is kept up to its work by a small spring S⁵. The catch S', which prevents the backward movement of the rotary frame G, is held in place by a small spring S⁵.

T is a guide-pin carried by a support T'. It engages with holes G⁸ in a ring G⁹ upon the support G and serves to prevent the rotation of the support G until it is in the desired position. A finisher W, comprising a pin W', having a head W², slides freely in bearings in the standards L' and is provided with a spring W³, operating between the head W² and one of the bearings. The function of this finisher is to force the roll of paper home into the end of the cigarette.

Fig. 5 illustrates a modification of the inserter O, in which the finger O¹⁴ is not fixed, but is carried by an extension of the guide O³, and consequently moves with it.

Figs. 6 and 7 show two other forms of breaker which have been found to work very satisfactorily.

The operation of this apparatus is as follows: It is assumed that the action of the shaft C has allowed the back plate H and support G to retire as near as possible to the trough J² and that the five holders G⁵ contain cigarettes. The continued rotation of the shaft C causes the cam D⁴ to advance the back plate H and support G to the limit of their travel, and during the first portion of this forward movement the inserter O winds up a strip of paper which has been supplied to it through the guide O³ during the previous retirement of the support G. While the support G advances, the following operations take place simultaneously: (a) The plunger K causes a fresh cigarette to enter the holder G⁵, which is in line with the trough J², and thus ejects a completed cigarette. (b) The breaker L breaks out the tobacco in the end of the cigarette contained in the holder opposite to it. (c) The blower N operates upon the cigarette in line with it. (d) The inserter O enters the prepared end of the cigarette opposite to it, carrying the roll of paper previously wound up by it. (e) The finisher W pushes home the roll of paper forming the reinforcement in the cigarette in line with it. During the latter part of the advance of the support G the cam D³ releases the catch S, but the rotation of the support G is prevented by the guide-pin T. The continued rotation of the shaft C causes the cam D⁴ to allow the support G to recede under the action of the spring G³. As it recedes it is released from the guide-pin T, and the spring G³, acting through the disk G² and flat spring G¹, causes the support G to rotate one step, thereby completing one movement of the whole machine.

Although in the previous description of the operation of this machine it has been assumed to facilitate comprehension of its operation that the one step has been completed in one movement, yet each step or rotary movement of the support G takes place in practice in two stages. For instance, when a cigarette has been operated upon by the breaker L the support G does not carry it around at once into line with the blower N, but first rotates through half the necessary distance and is caught by the lower arm of the pallet S. Upon its release thereby it rotates through the second portion of its travel and brings the cigarette into line with the blower N.

I claim—

1. In a machine for applying a reinforcing-mouthpiece to cigarettes, the combination with a holder for supporting the cigarette, of means for removing the tobacco from one end of the cigarette in order to provide a space thereat, substantially as described.

2. In a machine for applying a reinforcing-

mouthpiece to cigarettes, the combination with a holder for supporting the cigarette, of means for removing the tobacco from one end of the cigarette, and a device for inserting the reinforcement into the space thus formed, substantially as described.

3. In a machine for the purpose described, the combination with a holder for supporting the cigarette, of a device for loosening and removing tobacco from one end of the cigarette, means for inserting the reinforcing-mouthpiece into the end of the cigarette, and a finishing device for forcing the mouthpiece firmly into position, substantially as described.

4. In a machine for the purpose described, the combination with a holder, of a device adapted to enter one end of the cigarette to loosen and remove the tobacco therefrom, thereby leaving a space for the reception of a reinforcing-mouthpiece, and a device for forming and inserting the mouthpiece, substantially as described.

5. In a machine for the purpose described the combination with a series of cigarette-holders arranged on a rotary support, of a device adapted to enter one end of the cigarette to loosen and remove the tobacco therefrom, substantially as described.

6. In a machine for the purpose described, the combination with a rotary and reciprocating support, of a series of cigarette-holders arranged thereon, and a device for loosening and removing the tobacco at one end of the cigarette, substantially as described.

7. In a machine for the purpose described, the combination with a rotary support, of a series of cigarette-holders arranged thereon, a device adapted to enter one end of the cigarette to loosen the tobacco therein, and a blower cooperating with said device to remove the tobacco to form a space for the insertion of a reinforcing-mouthpiece, substantially as described.

8. In a machine for the purpose described, the combination with a rotary support carrying a series of cigarette-holders, of feed mechanism for successively supplying said holders with cigarettes, a device adapted to enter one end of the cigarette to remove the tobacco therefrom, and means for inserting a reinforcing-mouthpiece into the cigarette, substantially as described.

9. In a machine of the character described, the combination with a rotary and reciprocating support, of a plurality of cigarette-holders carried by said support, means for feeding cigarettes to said holders, a rotary device for removing tobacco from one end of the cigarette, and means for rolling up a strip of paper or other material and inserting the same into the end of the cigarette, substantially as described.

10. In a machine of the character described, the combination with a rotary support, of a series of cigarette-holders carried thereby, a

device for removing the tobacco from one end
of the cigarette, means for inserting a rein-
forcing-mouthpiece into the cigarette, a de-
vice for moving the rotary support length-
5 wise of its axial support, and a spring-pressed
finisher for firmly seating the mouthpiece,
substantially as described.

In testimony whereof I have hereto set my
hand in the presence of the two subscribing
witnesses.

JOSEPH SAMUEL BEEMAN.

Witnesses:

ALFRED J. BOULT,

HARRY B. BRIDGES.