No. 740,498. PATENTED OCT. 6, 1903.

E. B. WHITE.

CIGARETTE MACHINE.

APPLICATION FILED JAN. 9, 1899.

NO MODEL. 3 SHEETS—SHEET 1.

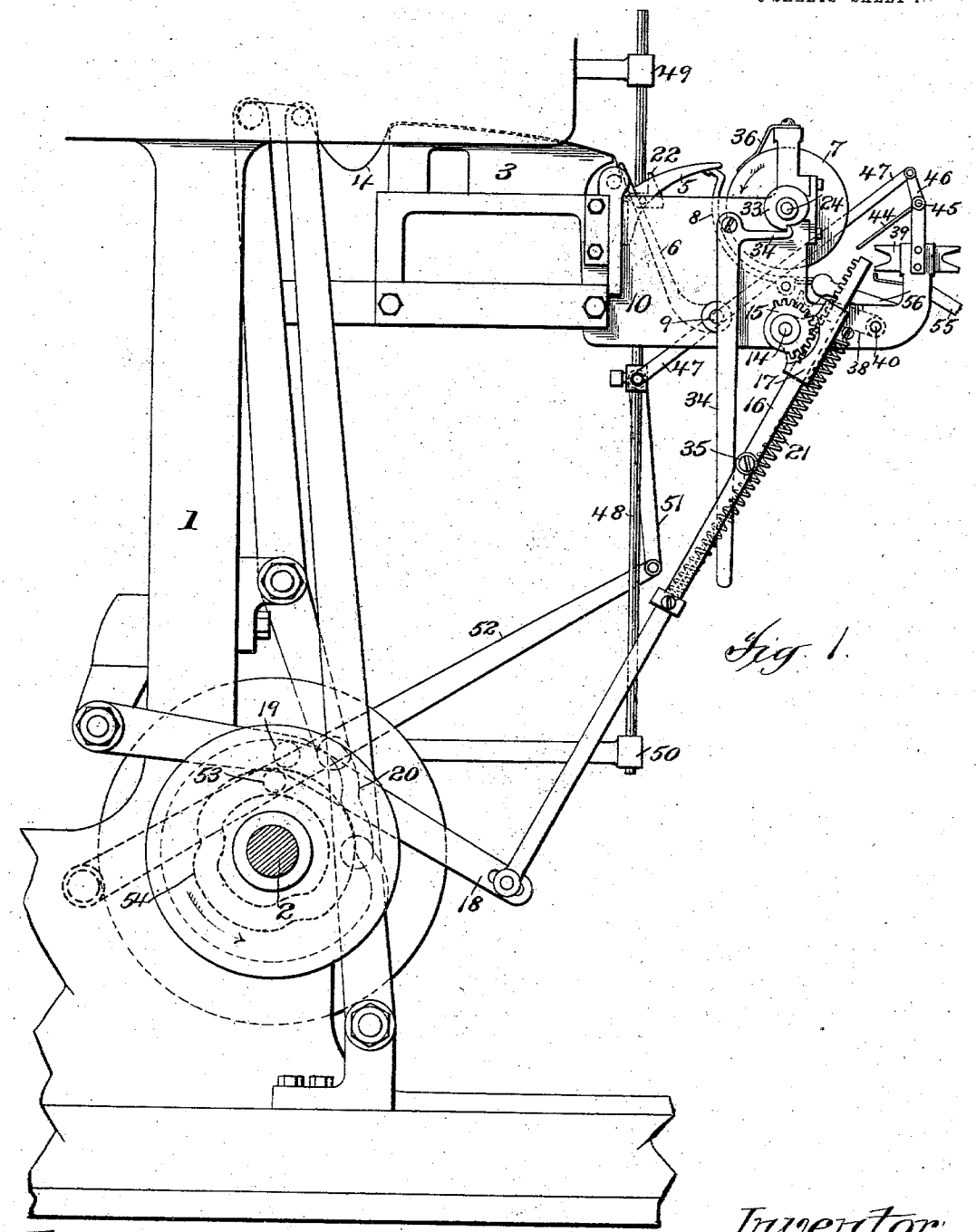


Fig. 1.

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NO MODEL. 3 SHEETS—SHEET 2.

Fig. 2

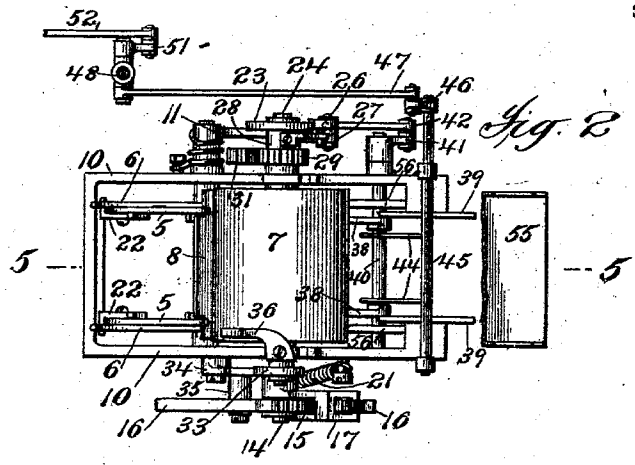


Fig. 3.

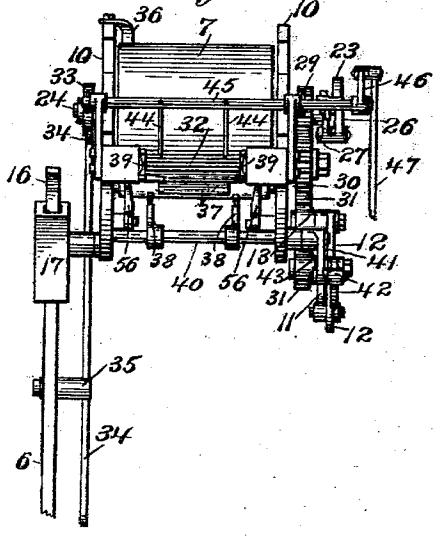
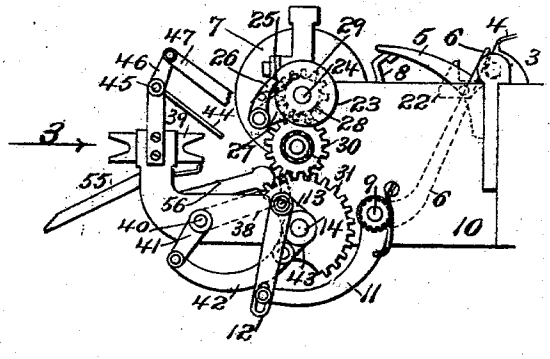


Fig 4.



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NO MODEL. 3 SHEETS—SHEET 3.

Fig. 5.

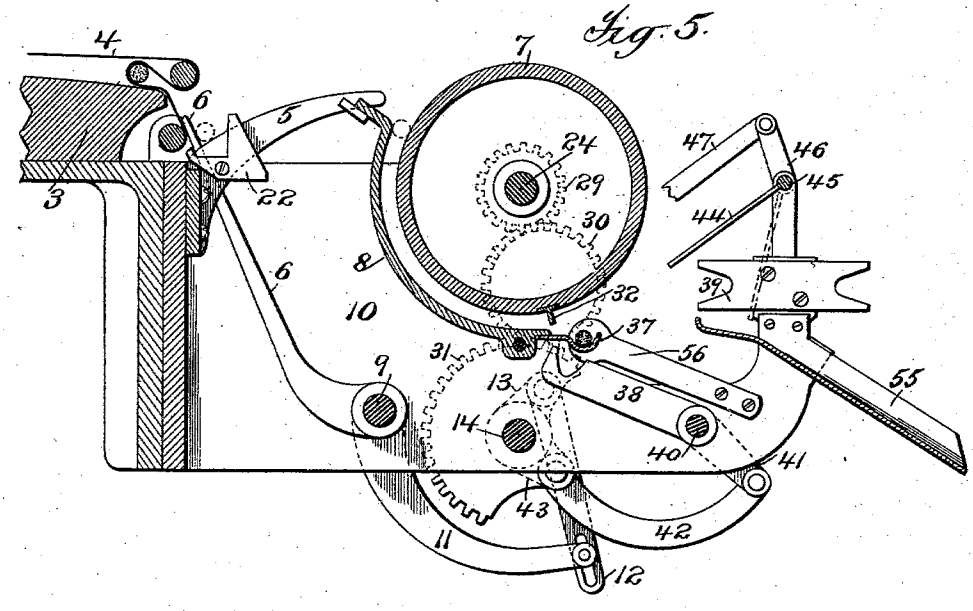
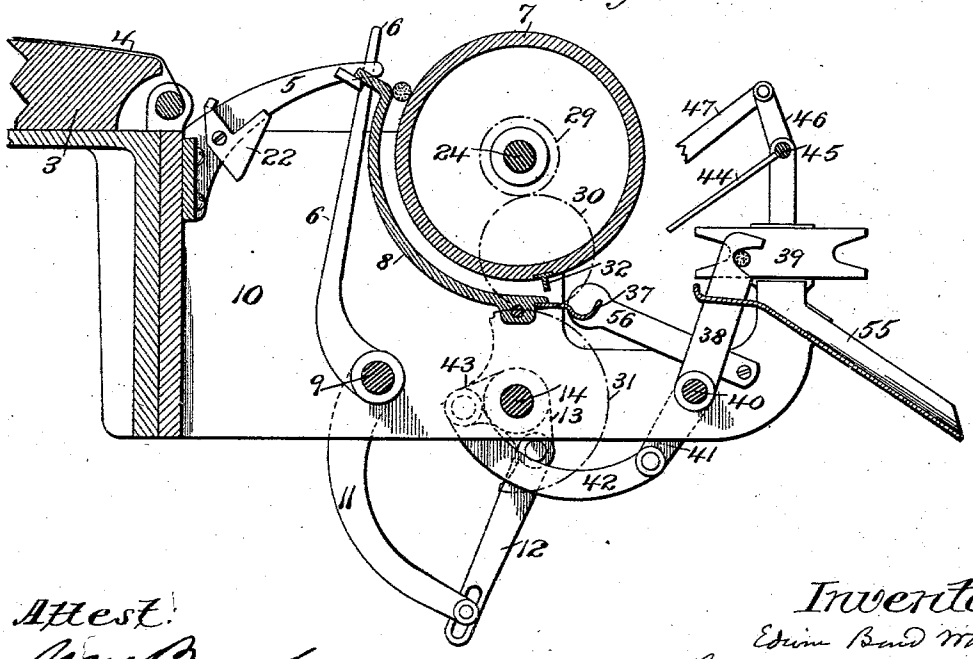


Fig. 6.



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No. 740,498. Patented October 6, 1903.

UNITED STATES PATENT OFFICE.

EDWIN BOND WHITE, OF RICHMOND, VIRGINIA, ASSIGNOR TO THE AMERICAN TOBACCO COMPANY, A CORPORATION OF NEW JERSEY.

CIGARETTE-MACHINE.

SPECIFICATION forming part of Letters Patent No. 740,498, dated October 6, 1903.

Application filed January 9, 1899. Serial No. 701,591. (No model.)

To all whom it may concern:

Be it known that I, EDWIN BOND WHITE, a citizen of the United States, residing at Richmond, county of Henrico, and State of Virginia, have invented certain new and useful Improvements in Cigarette-Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to delivery mechanism for cigarette-machines, and particularly to means for engaging the cigarette after it leaves the cigarette-cutting mechanism and ejecting it from the machine.

Although the present invention is capable of use in conjunction with cigarette-cutting mechanism generally, it has been designed particularly for use in conjunction with cutting mechanism acting upon all-tobacco cigarettes after the latter have left what is known as "cigarette-rerolling mechanism," a mechanism for operating upon all-tobacco cigarettes after they have left the cigarette-forming mechanism for the purpose of smoothing out their wrappers and removing wrinkles, creases, and other irregularities therefrom. For this reason the improvements of the present invention are herein illustrated and will be hereinafter particularly described in conjunction with such a rerolling mechanism.

In the accompanying drawings, Figure 1 is a side elevation of a portion of a cigarette-forming mechanism and a cigarette-rerolling mechanism provided with the improvements constituting the present invention. Fig. 2 is a detail in plan view of the rerolling mechanism and the mechanism embodying the present invention. Fig. 3 is an end view of the same looking toward the right of Fig. 4. Fig. 4 is a side elevation of the same looking toward the left of Fig. 3. Fig. 5 is a section, on an enlarged scale, taken on the line 5 of Fig. 2. Fig. 6 is a similar view illustrating some of the parts in different positions.

Referring to said drawings, 1 represents the frame of a cigarette-machine of the table and rolling-apron type commonly employed for making all-tobacco cigarettes; 2, its driving-shaft; 3, the table on which the cigarette is rolled, and 4 the apron for rolling the cigarette. These parts are of familiar form and require no further description here, except to state that in the position in which the parts are shown in Fig. 1 the apron 3 is shown as ready to receive a wrapper and tobacco to form a cigarette, while in Fig. 5 the cigarette is shown as formed with the apron in position to deliver it from the machine. From this cigarette-forming mechanism the cigarettes are delivered singly onto a pair of supporting-arms 5, whence they are delivered by a pair of vibrating fingers 6 into the control of a cylinder 7 and curved support 8, constituting the cigarette-rerolling mechanism, the purpose of which, as before stated, is to reroll the cigarette and remove from the wrapper thereof all creases, wrinkles, and other irregularities. The fingers 6 are actuated and the cylinder 7 intermittently rotated from the driving-shaft 2 through connections which will now be briefly described. For this purpose the fingers 6 are connected to a rock-shaft 9, journaled in the frame 10 of the rerolling mechanism and provided with a downwardly-extending spring-pressed arm 11, connected by a pin-and-slot connection with one end of a link 12, the opposite end of which is connected to a crank-arm 13, fast to one end of a shaft 14, journaled in the frame 10 of the rerolling mechanism. At its opposite end the shaft 14 is provided with a segmental gear 15, engaged by a rack-bar 16, sliding in a guide 17, journaled on the shaft 14. The rack-bar 16 is connected by a pin and slot with one end of a lever 18, fulcrumed in the frame 1 of the cigarette-forming mechanism and provided with a bowl 19, engaged by a cam 20 on the driving-shaft 2, the cam 20 during part of its rotation moving the lever 18 and rack-bar 16 downwardly against the tension of a spring 21, connected to the latter and to the frame 10, said spring after each downward movement of said lever and rack-bar returning them to their normal or upper position. As the parts are shown in Fig. 1 the rerolling-cylinder is at rest. As the driving-shaft rotates in the direction of the arrow, Fig. 1, the cam 20, engaging the bowl 19 of the lever 18, will depress the latter and the rack-bar 16 and through the gear 15 rotate the shaft 14, and thus through the crank-arm 13, link 12, and arm 11 move the

fingers 6 from the position in which they are shown in Fig. 5 to the position in which they are shown in Fig. 6, a cigarette during such movement of the fingers 6 being delivered to the rerolling mechanism. As the bowl 19 of the lever 18 leaves the high part of the cam 20 the spring 21 will draw the rack-bar 16 and lever 18 upwardly, the rack-bar 16 during such upward movement rotating the shaft 14 in the opposite direction. This movement of the shaft 14 will restore the crank-arm 13, link 12, and arm 11 from the position in which they are shown in Fig. 6 to the position in which they are shown in Fig. 5, thus returning the fingers 6 to position to receive another cigarette from the cigarette-forming mechanism.

As a cigarette is delivered from the forming mechanism it falls to the position shown by dotted lines in Fig. 5 in rear of a catcher 22, pivoted in the arms 5, and as the fingers 6 move the cigarette along the arms the cigarette swings the catcher 22 downwardly into the position shown in Fig. 6, the fingers 6 on their return movement engaging the rear end of the catcher and restoring it to normal position, as shown in Fig. 5.

The connections for intermittently rotating the rerolling-cylinder 7 will now be described. These connections consist of a disk or cam 23, fast to one end of the shaft 24 of the rerolling-cylinder and provided with a notch 25, engaged by a spring-pressed pawl 26, pivoted to an arm 27, which is fast upon a sleeve 28, journaled on the shaft 24, and which sleeve is provided with a pinion 29, connected by an intermediate 30 with a segmental gear 31 upon the end of the shaft 14 opposite that bearing the segmental gear 15. From these connections it results that as the rack-bar 16 is moved downwardly by the cam 20, as just described, for the purpose of moving the fingers 6 toward the rerolling mechanism to deliver a cigarette thereto the segmental gear 31 will through the intermediate 30 rotate the pinion 29 from left to right, Fig. 4, thus moving the pawl 26 away from the notch 25 in the disk 23, there being therefore no movement imparted to the rerolling-cylinder 7. The segmental gear 31, intermediate 30, and pinion 29 are, as will be observed, so proportioned relatively one to the other that during this downward movement of the rack-bar 16 the pinion 29 will make a complete revolution, thus again bringing the pivoted pawl 26 into engagement with the notch 25 of the disk 23. As the bowl 19 of the lever 18 leaves the high part of the cam 20 and the rack-bar 16 is then drawn upwardly by the spring 21 the shaft 14 will be rotated by the rack-bar in the opposite direction and the pinion 29 through the segmental gear 31 and intermediate 30 rotated from left to right, Fig. 4, and the pawl 26 thus through the disk 23 rotates the rerolling-cylinder 7 in a like direction or as indicated by the arrow in Fig. 1. This rotation of the cylinder 7 will continue during the upward movement of the rack-bar 16, the cylinder during such movement of the rack-bar making a complete revolution.

To insure the delivery of the cigarette from between the curved support or guide 8 and cylinder 7, the latter is provided with a longitudinal blade 32, which takes in behind the cigarette (see Figs. 5 and 6) and ejects it from the support 8. For the purpose of positively arresting the cylinder 7 after it has made a complete revolution it is provided with a notched disk or cam 33 upon the end of the shaft 24 opposite that provided with the notched disk or cam 23, the notch in the disk 33 being engaged by the short hooked arm of a lever 34, pivoted in the frame 10 and which is held normally in position for engaging the notch in disk 33 by the weight of its longer arm, this lever being moved out of locking position by a bowl 35, carried by the rack-bar 16 during the downward movement of the latter and maintained out of such locking position during the first part of the upward movement thereof and until rotation of cylinder 7 and shaft 24 has been begun and the disk 33 moved thereby out of position for engagement by the lever 34. As the shaft 24 completes a revolution the disk 33 is engaged by the lever 34 and rotation of said shaft and cylinder 7 thus positively arrested. To prevent rebound of the cylinder 7 when thus arrested and also to overcome any tendency it may have for any other reason to move rearwardly, a spring-brake 36 is provided, Figs. 2 3, bearing against the face of the cylinder.

From the foregoing it will be observed that during the downward movement of the rack-bar 16 the fingers 6 are moved from their cigarette-receiving position toward the rerolling-cylinder 7 to deliver a cigarette thereto, that during such downward movement of the rack-bar 16 the rerolling-cylinder 7 remains at rest, and that upon the upward movement of the rack-bar 16 under the stress of the spring 21 the fingers 6 are returned to receiving position and the rerolling-cylinder rotated in the direction of the arrow, Fig. 1, to reroll the cigarette delivered to it by said fingers 6. From this rerolling mechanism the cigarettes are delivered singly into the control of cutting devices for trimming the ends of the cigarettes. For this purpose the machine is provided with a trough 37, into which the cigarette is delivered as it leaves the curved support 8. Upon opposite sides of such trough are a pair of vibrating cutters 38 for engaging the cigarette delivered upon the trough 37 and moving it upwardly into engagement with stationary cutters 39, mounted in the frame 10, with which stationary cutters the vibrating cutters 38 coact for the purpose of trimming the ends of the cigarette. The vibrating cutters 38 are adapted to be actuated intermittently from the driving-shaft 2 and for this purpose are mounted upon a rock-shaft 40, journaled in the frame

10, which rock-shaft is provided with an arm 41, connected through a link 42 with a crank-arm 43 upon the shaft 14, which, as before stated, is rotated first in one direction and then in the other by the sliding rack-bar 16. The connections between the shaft 14 and cutters 38 are such that the movement of the vibrating cutters toward the stationary cutters 39—that is, from the position in which they are shown in Fig. 5 to the position in which they are shown in Fig. 6—takes place during the upward movement of the rack-bar 16, this movement of the vibrating cutters 38 being simultaneous with the movement of the fingers 6 from their receiving position toward the rerolling mechanism. The return movement of the vibrating cutters 38 likewise takes place simultaneously with the return to receiving position of the fingers 6.

In order to insure the delivery of the trimmed cigarette from between the supports or shanks of the stationary cutters 39, where it is left by the vibrating cutters, it is necessary to provide means for positively engaging the side of the cigarette and moving it from between such shanks or supports. Cigarettes, and particularly all-tobacco cigarettes, immediately after being operated upon by the forming mechanism of a rerolling mechanism are very delicate and require very careful handling or manipulation in order to avoid breakage or distortion or other injury to the cigarette, and the mechanism provided for positively engaging and moving the cigarettes from between the shanks or supports of the stationary cutters 39 must be of such character as to engage and move the cigarette in such way as to avoid all liability of such injury. Mechanism of this character is provided by the present invention, which mechanism will now be described. This mechanism consists of a pair of pivoted vibrating fingers 44, carried by a rock-shaft 45, journaled in brackets in the frame 10 of the rerolling mechanism and provided with an arm 46, connected to one end of a link 47, the opposite end of which is connected to a sliding rod 48, sliding in guides 49 50, this sliding rod being in turn connected by a link 51 to one end of a lever 52, the opposite end of which is fulcrumed in the frame of the cigarette-forming mechanism and which is provided with a bowl 53, engaged by a cam 54 on the driving-shaft 2 of the machine. The lever 52 is moved positively up and down by the cam 54, and during its upward movement it moves the sliding rod 48 upwardly, thus throwing the fingers 44 to their rearward position, as illustrated in Figs. 1 and 6 and in full lines in Fig. 5, and on its downward movement moves the fingers 44 in the opposite direction to the position in which they are shown by dotted lines in Fig. 5, the fingers 44 in moving to this latter position engaging the cigarette and moving it from between the shanks or supports of the stationary cutters 39. The cigarette thus moved by the fingers 44 is dropped onto a stationary inclined table 55, whence it is delivered into any convenient receptacle.

The cam 54 is so formed and so timed relatively to the movement of the vibrating cutters 38 that during the movement of said cutters from cigarette-receiving position toward the stationary cutters 39 the vibrating fingers 44 are retained by the cam 54 in their rearward position. (Illustrated in Fig. 1.) As soon as, or shortly after, the movement of the vibrating cutters 38 toward the stationary cutters 39 is completed the cam 54 will rock the lever 52 and the sliding rod 48 downwardly, thus moving the fingers 44 against the cigarette lying between the supports or shanks of the stationary cutters 39 into the position shown by dotted lines in Fig. 5. The fingers 44 move twice into ejecting position during the rotation of the cam 54, which is so formed, as shown in Fig. 1, as to depress the lever 52, then raise the same, and then again depress it, so that the vibrating fingers 44 are thrown forward twice during each operation of the machine. The engagement of the cigarette by the fingers 44 takes place just before or just as the vibrating cutters 38 start on their return movement away from the stationary cutters 39, so as to prevent the withdrawal of the cigarette by the cutters 38 from between the cutters 39. This is a feature of importance, as it prevents injury to or breakage of the cigarettes, which would result from their withdrawal by the cutters 38. The extent of movement of the fingers 44 also is such as to insure the ejection positively of the cigarettes singly from between the stationary cutters 39, and this also is a feature of importance, as unless the cigarettes be thus ejected they are liable to stick and accumulate between the cutters 39, in which case in order to remove them it is necessary for the attendant to do so by hand, with the liability of injury from the vibrating cutters 38.

To insure the proper delivery of the cigarettes to the trough 37 and vibrating cutters 38, a pair of guides 56 is provided on opposite sides of the trough, which engage the ends of the cigarette and move them endwise to center them.

What is claimed is—

1. The combination with a cigarette-forming mechanism of a pair of vibrating cutters receiving the cigarette therefrom, a second pair of cutters coacting therewith and between which the cigarette is delivered thereby, and an ejecting mechanism comprising a pivoted and downwardly-acting member passing between the cutters of each pair for ejecting the cigarettes from between the second pair of cutters; substantially as described.

2. The combination with a cigarette-forming mechanism of a pair of vibrating cutters receiving the cigarette therefrom, a second pair of cutters coacting therewith and between which the cigarette is delivered there-

by, and an ejecting mechanism comprising a vibrating pivoted and downwardly-acting member passing between the cutters of each pair for ejecting the cigarettes from between the second pair of cutters; substantially as described.

3. The combination with a cigarette-forming mechanism of a pair of vibrating cutters receiving the cigarette therefrom, a second pair of cutters coacting therewith and between which the cigarette is delivered thereby, and an ejecting mechanism comprising pivoted pins or the like passing between the cutters of each pair for ejecting the cigarettes from between the second pair of cutters; substantially as described.

4. In a cigarette-machine, the combination with a rerolling mechanism of a pair of vibrating cutters receiving the cigarette therefrom, a second pair of cutters coacting therewith and between which the cigarette is delivered thereby, and an ejecting mechanism comprising a pivoted and downwardly-acting member passing between the cutters of each pair for ejecting the cigarettes from between the second pair of cutters; substantially as described.

5. In a cigarette-machine, the combination with a rerolling mechanism of a pair of vibrating cutters receiving the cigarette therefrom, a second pair of cutters coacting therewith and between which the cigarette is delivered thereby, and an ejecting mechanism comprising a vibrating pivoted and downwardly-acting member passing between the cutters of each pair for ejecting the cigarettes from between the second pair of cutters; substantially as described.

6. In a cigarette-machine, the combination with a rerolling mechanism of a pair of vibrating cutters receiving the cigarette therefrom, a second pair of cutters coacting therewith and between which the cigarette is delivered thereby, and an ejecting mechanism comprising vibrating pins or the like passing between the cutters of each pair for ejecting the cigarettes from between the second pair of cutters; substantially as described.

7. The combination with a cigarette-forming mechanism, of a pair of vibrating cutters receiving the cigarette therefrom, a second pair of cutters coacting therewith and between which the cigarette is delivered thereby and an ejecting mechanism comprising a member passing between the cutters of each pair for ejecting the cigarettes from between the second pair of cutters, said member in ejecting the cigarettes moving in the same direction as the vibrating cutters on their movement toward the second pair of cutters, substantially as described.

8. The combination with a cigarette-forming mechanism, of a pair of vibrating cutters receiving the cigarette therefrom, a second pair of cutters coacting therewith and between which the cigarette is delivered thereby and an ejecting mechanism comprising a vibrating member passing between the cutters of each pair for ejecting the cigarettes from between the second pair of cutters, said member in ejecting the cigarettes moving in the same direction as the vibrating cutters on their movement toward the second pair of cutters and engaging the cigarettes before the return movement of said vibrating cutters, substantially as described.

9. The combination with a cigarette-forming mechanism, of a pair of vibrating cutters receiving the cigarette therefrom, a second pair of cutters coacting therewith and between which the cigarette is delivered thereby and an ejecting mechanism comprising a pivoted and downwardly-acting vibrating member passing between the cutters of each pair for ejecting the cigarettes from between the second pair of cutters, said member in ejecting the cigarettes moving in the same direction as the vibrating cutters on their movement toward the second pair of cutters, substantially as described.

10. In a cigarette-machine the combination of stationary cutters 39, vibrating cutters 38, downwardly-extending pins 44 passing between the cutters of each pair, and connections with the driving-shaft for vibrating said pins, substantially as described.

11. In a cigarette-machine the combination of stationary cutters 39, vibrating cutters 38, sliding rod 48, pins 44 passing between the cutters of each pair, connections between the rod and pins for vibrating the latter, and connections with the driving-shaft for actuating said rod, substantially as described.

12. In a cigarette-machine the combination of stationary cutters 39, vibrating cutters 38, rock-shaft 45 pins 44 passing between the cutters of each pair, and connections with the driving-shaft for actuating said rock-shaft, substantially as described.

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

EDWIN BOND WHITE.

Witnesses:
WM. WOODWARD CLOUD,
W. HOWARD HAMILTON.