This invention relates to cigarette collectors for continuous rod cigarette machines, particularly those of the high speed type recently developed, designed to catch cigarettes issuing from the machine, stop their longitudinal movement and deposit them in uniform alignment on a delivery belt. If the cigarettes from the cigarette rod cutoff are discharged directly on the usual delivery belt running at right angles to the direction of the movement of the cigarette rod, they will overshoot the delivery belt when the machine is running at its highest speed and fall short thereof when it is running at low speed, and in any case the positioning of the cigarettes on the belt will be quite erratic. Hitherto, a degree of control over the position taken by the cigarettes deposited on the delivery belt has been attained by discharging the cigarettes against a stop wall from which they fall on the delivery belt. In the recently developed high speed cigarette machines in which the travel of the cigarette rod is sometimes more than double that of the previous slow speed machines, this is impractical because it results in injury to the ends of the cigarettes and undue production of tobacco shorts from the cigarette ends, and because the rebound of the cigarettes at such speeds is somewhat erratic and varies with the speed of the machine.

The main object of this invention is to collect cigarettes from such a machine, halt their longitudinal movement, and deposit them in relatively accurate alignment on the crosswise delivery belt. Another object is to provide means which will stop the longitudinal movement of the cigarettes even when traveling at what are, according to the present standards, very high speeds, without injury to the ends of the cigarettes or undue production of tobacco shorts therefrom. Still another object is to provide such a cigarette collector which will deposit the cigarettes in the same delivery position whether the machine is going very fast or very slow. Another object is to provide a collector of a type so constructed that defective cigarettes, due to stopping or starting the machine or other causes, may be diverted from the collector.

With these and other objects not specifically mentioned in view, the invention consists in certain constructions and combinations which will be hereinafter fully described and then particularly pointed out in the claims.

In the accompanying drawings which form a part of this specification and in which like characters of reference indicate the same or like parts:

- Fig. 1 is a side elevation, partly broken away, of a device constructed in accordance with the invention;
- Fig. 2 is an end elevation taken on the line 2-2 of Fig. 1;
- Fig. 3 is a detail side elevation of a portion of the device shown in Fig. 1;
- Fig. 4 is a detail view in cross section through the center of the collector drum;
- Fig. 5 is a detail plan view along line 5-5 of Fig. 1;
- Fig. 6 is a detail side elevation; and
- Fig. 7 is a detail end elevation showing a modification of the collector shown in Fig. 1.

In carrying the invention into effect, there is provided mechanism for forwarding cigarettes from the cigarette machine, a rotating drum provided with axial pockets for successively receiving cigarettes from the forwarding mechanism, and means associated with said drum for stopping cigarettes and aligning them in said pockets. In the best constructions, said mechanism includes two belts for forwarding the cigarettes between them, this mechanism preferably including a tilting frame for carrying the belts. In the best constructions also, weak springs are provided operative in the pockets for stopping the entering cigarettes. Preferably, there is also provided a guide concentric with said drum for aligning cigarettes in the pockets. It is also contemplated that in the preferred form, means will be provided for moving the springs out of operative position while the guide is in action.

The above means and parts may be widely varied in construction within the scope of the claims, for the particular structure selected
to illustrate the invention is but one of many possible concrete embodiments of the same. The invention, therefore, is not to be restricted to the precise details of the structure shown and described.

Referring to Figs. 1 to 5 of the drawings, the cigarettes C as they issue from the tube 10 of the cigarette cutoff (Figs. 1 and 5), are seized and forwarded between parallel grooved belts 11 and 12. These belts run over pulleys 13, 14 and 15, 16 respectively, on shafts 17, 18, 19 and 20 mounted on a tiltable frame consisting of the side members 21 and 22, and belts 11 and 12 are driven by a belt 23 running over pulley 24 on the shaft 19, which shaft is geared to the shaft 17 by gears 25 and 26. The belts 11 and 12 are driven at a speed slightly greater than that of the cigarette rod in order to separate the cigarettes during forwarding. The frame members 21 and 22 are pivoted on shaft 19 in a bearing 27.

The cigarettes are successively received from the forwarding belts 11 and 12 by axial pockets formed in and between the upstanding walls of trough shaped slides 29 mounted for axial movement in slots 30 of a drum 31 rotating in timed relation to the operation of the cigarette cut-off and forwarding belts 11 and 12. The pockets in the drums are in alignment with the spaces between short guide walls 32 which guide the cigarettes as they enter the pockets from the forwarding belts. To stop the cigarettes in the pockets without danger of injuring the forward ends thereof, each upstanding slide wall has secured to it a weak leaf spring 33 bowing into the pocket so as to wedge the entering cigarette between it and the opposite slide wall, thereby absorbing its momentum and gently stopping it. In order to align cigarettes in the pockets, there is provided a guide concentric with the drum extending from a point at a little to one side of the cigarette receiving position at the top of the drum to the delivery position on the under side of the drum adjacent the delivery belt 48. This stationary guide 34 is secured outside of the drum and projects into the spaces between the guide walls 32 and the slides 29, closely encircling the periphery of the drum so that it will engage the rear ends of the cigarettes in the pockets. This guide is curved lengthwise of the drum from a position adjacent the guide walls 32 at the receiving position to a position spaced one cigarette length from the forward end of the drum at delivery position. The guide 34 is suitably secured to the guard 36 encircling the major portion of the drum, by means of angle pieces 35. The guard 36 is attached to the frame 28 of the cigarette machine by bracket 37.

The drum 31 is rotated on the stationary shaft 38 in bearing 39 by a gear 40 driven from the gear 41 on the upper end of the vertical drive shaft 42 in a bearing 43, which latter shaft is driven from the main drive shaft of the cigarette machine.

The springs 35 are moved out of operative position while the guide 34 acts to align the cigarettes in the pockets, by a stationary cam on shaft 38. For this purpose each of the slides 29 is mounted on a block 45 having a roller 46 in engagement with the cam track of the cam 44. In the path of the bowed springs, as they are thus moved lengthwise of the drum, are lugs 47 secured to the end of the drum. These lugs operate as shown in Fig. 5 to press the springs out of engagement with the cigarettes to thereby release them. The lugs 47 also serve to limit the longitudinal movement of the cigarettes to a position with their forward ends adjacent the forward end of the drum. The cigarettes are thus left free in the pockets and are slid into accurate alignment at the forward end of the drum by the sliding engagement of the guide 34 against their rear ends.

After passing below the axis of the drum, the cigarettes will roll away from the circumference of the drum, being held in the pockets by the guard 36 until they reach the end of the guide 34 and the end of the guard 36 at the delivery position on the under side of the drum, at which position they drop onto the delivery belt 48 running over pulleys 49 on shafts 50 in bearings 51.

In order to avoid feeding the defective cigarettes, which result from starting and stopping the machine, onto the feed belt where they will be mixed with good cigarettes, the cigarette forwarding belts 11 and 12 (Figs. 1, 3 and 5), are mounted on a tiltable frame 21, 22 pivoted on the shaft 19 and provided with an arm 52 extending beyond the pivot. The arm 52 carries pivoted thereon a vertically suspended latch 53 having a lateral extension at its upper end, normally drawn downwardly to swing the latch into position to lock the forwarding mechanism in operative position, by engagement with an abutment 55. A rod 56 connected to the operating lever of the starting clutch of the cigarette machine for actuation thereby, is supported by a bearing bracket 57 in a position, as shown in Fig. 3, such that its end engages the lower portion of the latch 53. The connection of this rod with the clutch operating lever is such that the movement of the clutch operating lever to throw out position to stop the machine pushes the rod 56 in the direction of the arrow in Fig. 3, thereby pushing the latch 53 off the abutment 55 so that the spring pulls the latch downwardly and tilts the forwarding mechanism upwardly, diverting the defective cigarettes to a position above the guard 36, instead of into the collector drum pockets. When the clutch operating lever has been thrown to clutch engaging position.
the rod 56 will be withdrawn and the forwarding mechanism can be tilted downwardly by means of handle 60, at which position it will again be latched in horizontal position to forward cigarettes in the pockets of the collector drum.

In Figs. 6 and 7, a modified construction of the collector mechanism on the drum is shown. Instead of the trough shaped slides of Figs. 1 to 5, equally spaced reciprocating division walls 61 are provided mounted on separate block 62, each of which has a cam roller in engagement with a stationary cam 64 similar to the cam 44 of Figs. 1 and 2.

Pins 65 projecting radially from the periphery of the drum into the pockets formed by said walls, are positioned to engage the bowed springs to release the cigarettes and to limit the longitudinal movement of the cigarettes in the pockets.

In view of the foregoing, further description of the operation of the device is deemed unnecessary and is omitted for the sake of brevity. It will be seen that a cigarette collector has been provided in which the cigarettes will be positively aligned and deposited in a definite predetermined position upon the delivery belt which leads to the usual magazine boxes in which the cigarettes are transferred to the packaging machine, and the alignment of the ends of the cigarettes on this belt is independent of the vagaries of inertia and friction. Consequently, the positioning of cigarettes deposited by this collector will be the same whether the cigarette machine is run very fast as contemplated, or at varying speeds, regardless of changes in this or other operating conditions.

What is claimed is:

1. A cigarette collector comprising mechanism for forwarding cigarettes, a rotating drum provided with axial pockets successively receiving cigarettes from said mechanism, and means associated with said drum for stopping and aligning cigarettes entering said pockets.

2. A cigarette collector comprising mechanism for forwarding cigarettes, a rotating drum provided with axial pockets successively receiving cigarettes from said mechanism, and means associated with said drum for stopping and aligning cigarettes in said pockets, said mechanism including two belts forwarding cigarettes between them.

3. A cigarette collector comprising mechanism for forwarding cigarettes, a rotating drum provided with axial pockets successively receiving cigarettes from said mechanism, and means associated with said drum for stopping and aligning cigarettes in said pockets, said mechanism including means for holding it in and out of operative position.

4. A cigarette collector comprising mechanism for forwarding cigarettes, a rotating drum provided with axial pockets successively receiving cigarettes from said mechanism, and means associated with said drum for stopping and aligning cigarettes in said pockets, said mechanism including two belts forwarding cigarettes between them, and a tilting frame carrying said belts.

5. A cigarette collector comprising mechanism for forwarding cigarettes, a rotating drum provided with axial pockets successively receiving cigarettes from said mechanism, and means associated with said drum for stopping and aligning cigarettes in said pockets, said mechanism including two belts forwarding cigarettes between them, a tilting frame carrying said belts, a latch normally holding said belts in operative position, and a spring for throwing said belts out of operative position when said latch is displaced.

6. A cigarette collector comprising mechanism for forwarding cigarettes, a rotating drum provided with axial pockets successively receiving cigarettes from said mechanism, and means associated with said drum for stopping and aligning cigarettes in said pockets, said means including weak springs operative in said pockets for stopping entering cigarettes.

7. A cigarette collector comprising mechanism for forwarding cigarettes, a rotating drum provided with axial pockets successively receiving cigarettes from said mechanism, and means associated with said drum for stopping and aligning cigarettes in said pockets, said means including a guide concentric with said drum for aligning cigarettes in said pockets.

8. A cigarette collector comprising mechanism for forwarding cigarettes, a rotating drum provided with axial pockets successively receiving cigarettes from said mechanism, and means associated with said drum for stopping and aligning cigarettes in said pockets, said means including weak springs operative in said pockets for stopping entering cigarettes, a guide concentric with said drum for aligning cigarettes in said pockets, and means for moving said springs out of operative position while said guide is in action.

9. A cigarette collector comprising mechanism for forwarding cigarettes, a rotating drum provided with axial pockets successively receiving cigarettes from said mechanism, and means associated with said drum for stopping and aligning cigarettes in said pockets, said means including weak springs operative in said pockets for stopping entering cigarettes, and cam-actuated slides carrying said springs and moving them in and out of operative position.

10. A cigarette collector comprising mechanism for forwarding cigarettes, a rotating drum provided with axial pockets successively receiving cigarettes from said mecha-
nism, means associated with said drum for stopping and aligning cigarettes in said pockets, and a stationary shaft on which said drum rotates, and a stationary cam on said shaft and controlling the action of said stopping means.

In testimony whereof, I have signed my name to this specification.

JOHN ALFRED STEIN.