Jan. 27, 1931. W. B. BRONANDER 1,790,404

CIGARETTE COLLECTOR

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Fig. 1.

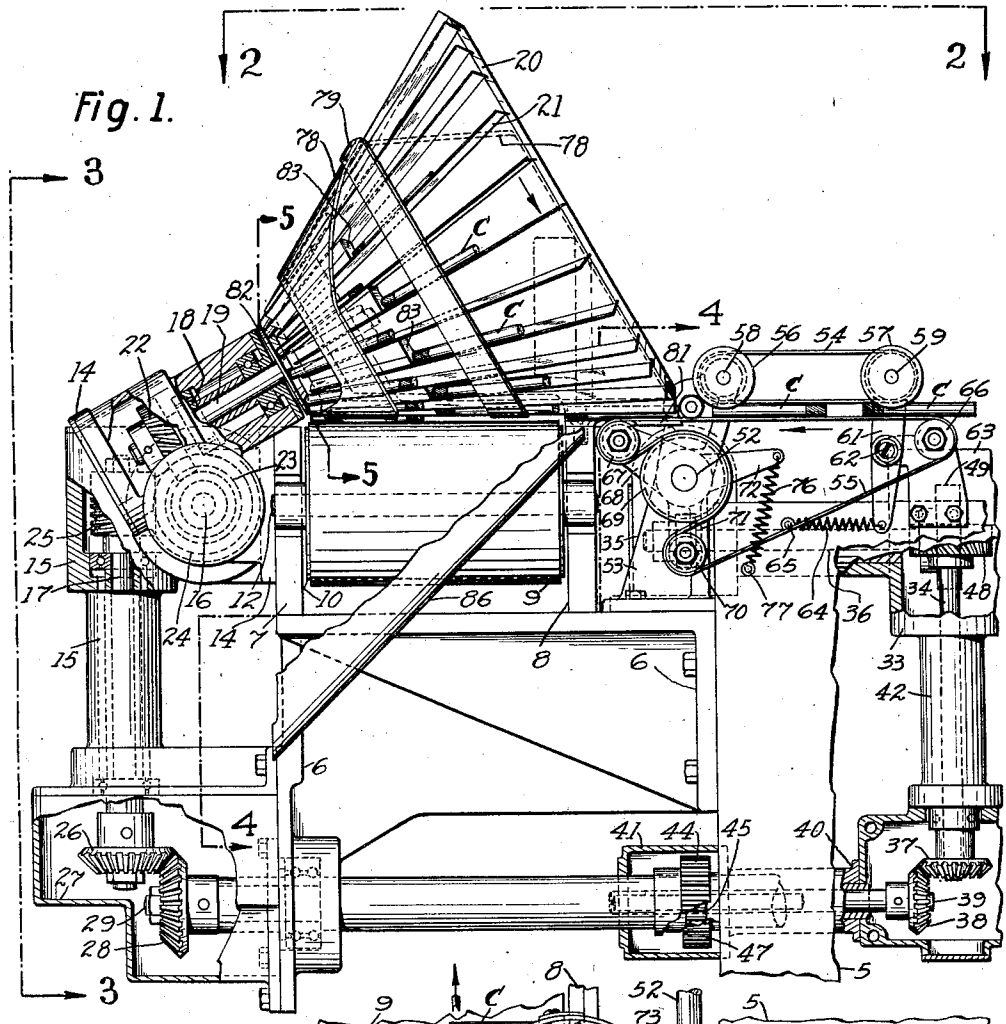

Fig. 2.

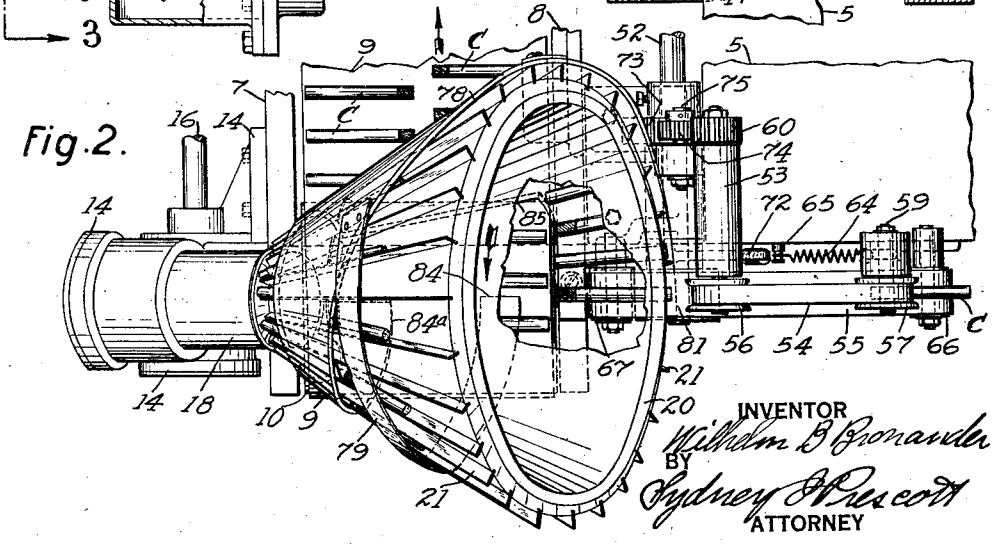

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Fig. 5.

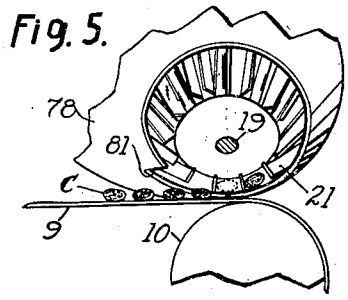
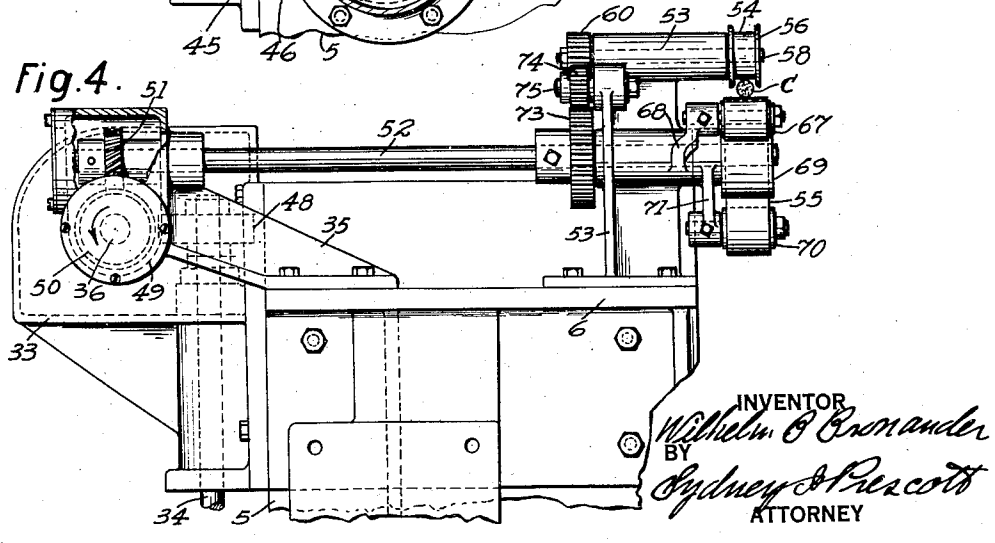


Fig. 3.

Fig. 4.



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UNITED STATES PATENT OFFICE

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CIGARETTE COLLECTOR

Application filed January 20, 1930. Serial No. 422,126.

This invention relates to cigarette collectors for continuous rod cigarette machines and particularly to collectors intended for use with high speed cigarette machines and machines making tipped cigarettes in which the cigarettes are to be delivered in two rows with the tips in each row pointing in the same direction. The invention is also applicable to the handling of oval cigarettes.

In high speed machines in which the cigarettes travel three hundred and more feet per minute, difficulty is encountered in halting the longitudinal movement of the cigarettes without injuring the ends of the cigarettes and in getting the caught cigarettes out of the way of following cigarettes with sufficient rapidity. Also due to the tendency of the cigarettes to rebound or jump at high speeds from whatever is used to stop their longitudinal movement it has been found difficult to deliver the cigarettes from the collector in a row with their ends in alignment so that they are convenient for packing.

Accordingly it is one of the principal objects of this invention to provide a collector which will satisfactorily overcome the above difficulties and which at the same time will be simple and reliable.

Another object of the invention is to provide a collector having the above characteristics which will deliver alternate cigarettes in separate rows so that in making tipped cigarettes which come out of the machine tip to tip, the cigarettes will be automatically sorted into two rows each having the tips pointing the same way. Such a delivery is also desirable with high speed machines even when not making tipped cigarettes in order that two operators may cooperate conveniently in carrying off the great volume of cigarettes produced.

Another object of the invention is to provide a collector which will take oval cigarettes which come from the machines with the printed sides of each cigarette up or facing the same way and deliver them on to a delivery belt or other delivery means, still with the same side of each cigarette up or facing the same way, ready for packing so as to give a uniform appearance. With these and other objects not specifically mentioned in view, the invention consists in certain constructions and combinations which will hereinafter be fully described and then specifically set forth in the claims hereunto appended.

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 construction carrying the invention into effect; Fig. 2 is a plan view partly broken away of the device shown in Fig. 1; Fig. 3 is an end elevation partly broken away seen from the line 3—3 of Fig. 1; Fig. 4 is a detail view taken on the line 4—4 of Fig. 1; Fig. 5 is a detailed sectional view on the line 5—5 of Fig. 1 showing the device operating on oval cigarettes.

In carrying the invention into effect there is provided a cigarette catcher having a series of cigarette pockets together with means for rotating said catcher to successively move said pockets into axial alignment with oncoming cigarettes and thence through an inclined position with respect thereto to delivery position to thereby slide each cigarette to an aligned position with relation to the other cigarettes in said pockets. In the best construction said catcher includes a rotatable device on which the pockets are arranged in conical formation. Preferably said catcher is positioned to overlie the path of the oncoming cigarettes. The best constructions further include a guard extending about said collector from receiving to delivery position to retain cigarettes in the pockets and it is contemplated that this guard be placed sufficiently close to the bottom of the pockets to positively prevent rotation of oval cigarettes therein. The best constructions will further include aligned cigarette stops associated with said pockets, the stops in alternate pockets being longitudinally offset to align alternate cigarettes in separate rows.

The various means referred to may be widely varied in construction within the scope of the claims, for the particular device selected to illustrate the invention is but one of many concrete embodiments of the same.

The invention therefore is not restricted to the precise details of the structure shown and described.

Referring now to the drawings. The frame of the collector is secured to the table 5 of the cigarette machine of which the collector forms a part, and comprises a bracket 6 which carries two frames 7 and 8 supporting a cigarette delivery belt 9 running over pulleys 10 and 11 on shafts 12 and 13, respectively. The frame 7 carries a housing 14 and, together with bracket 6, a housing 15 which supports a horizontal shaft 16. The housing 15 supports a vertical shaft 17.

In bearings 18 of housing 14 is journaled an upwardly inclined shaft 19 which carries a catcher element comprising a conical drum 20 whose surface is divided by division walls 21 extending longitudinally from the base of the cone toward its apex, into an even number of wedge shaped pockets much longer than the cigarettes, every second one of which is subdivided longitudinally by a transverse wall or partition preferably a little more than a cigarette length from the apex end of the cone.

On the lower end of the shaft 19 is mounted a spiral gear 22 which is in mesh with a spiral gear 23 on the shaft 16. The shaft 16 is provided with a worm-wheel 24 and is driven by a worm 25 on the shaft 17. The latter shaft on its lower end has a bevel gear 26 projecting into a guard-housing 27 attached to table 5 and is driven by bevel gear 28 on the main shaft 29. The other end of the shaft 16 has a bevel gear 30 in mesh with a bevel gear 31 on the pulley shaft 13, the gears 30 and 31 being enclosed in a housing 32 attached to the side of the frame 7. To the rear of table 5 is affixed a housing bracket 33 which supports a vertical shaft 34 and, together with housing 35, a horizontal shaft 36. The housing 35 is attached to bracket 6. The lower end of the shaft 34 has a bevel gear 37 in mesh with and driven by a bevel gear 38 on a shaft 39 which shaft is supported by a sleeve 40 of a housing 41 fastened to the table 5. The shaft 29 carrying a spur gear 44 drives the intermediate gear 45 on stud 46 which in turn meshes with a gear 47 on the shaft 39. The upper end of the shaft 34 carries a spiral gear 48 in mesh with a spiral gear 49 on shaft 36, the other end of which carries a spiral gear 50 driving a spiral gear 51 on a shaft 52 which is supported by a housing 35 and a bracket 53 attached to the bracket 6.

The cigarettes C issuing from the cutoff enter between a pair of endless transfer belts 54 and 55. The upper transfer belt 54 runs over pulleys 56 and 57 on studs 58 and 59. The stud 58 is held by a bracket 53 which also carries a spur gear 60, while the stud 59 is held by a lever 61 eccentrically mounted by means of a screw 62 on a frame 63 fastened to table 5. A spring 64 attached to the lever 61 and anchored to a pin 65 in table 5 holds the belt 54 in tension. The lower transfer belt 55 runs over a pulley 66 on a frame 63, over pulley 67 on a stud in an extension arm 68 of the bracket 53 thence over a drive pulley 69 on shaft 52, and then over the tightener pulley 70 on a stud in the arm 71 of the lever 72. The spur gear 73 on shaft 52 drives the intermediate gear 74 on stud 75 which drives the spur gear 60 on a shaft 58. A spring 76 anchored to a pin 77 in table 5 and attached to arm 72 holds belt 55 in the proper tension. These belts are driven faster than the cigarette rod to separate the oncoming cigarettes.

When a cigarette has been propelled into the lowermost pocket of the rotating drum 20, which is so rotated that this pocket is aligned with the path of the oncoming cigarettes it is carried along by the transverse motion of the drum, being held in the compartment by the cone shaped guards 78 and 79 attached by a bracket 80 to a frame 8 and surrounding the drum. The end flap 81 of guard 78 projects under the lower transfer belt 55 near pulley 67 to receive the cigarette and lead it on its way around the drum. As the drum revolves, the lower pocket just loaded changes from a horizontal to a more and more inclined position, with respect to the horizontal path of the cigarette rod so that a cigarette therein by gravity slides down towards the apex of the cone until stopped either by the stop disk 82 on shaft 19 near the apex of the cone, or by a series of partitions or stops 83, according to whether the cigarette happens to be in an undivided or in a divided pocket.

The drum 20 and the transfer belts 54 and 55 are so timed with reference to the cutoff that a cigarette is fed into the end of each pocket as it occupies the horizontal or lowermost position on the drum, therefore the cigarettes proceeding from the cutoff are alternately placed in a divided and undivided pocket, and all cigarett[illegible]th the cork tip pointing one way a[illegible] against the disk 82 and all thos[illegible] way against the stop walls 83. A[illegible] complete revolution, the cigarette[illegible]ded by flaps 84 and 84a of the gua[illegible] and 79 upon the discharge belt 9 on which they thus form two separate rows. This belt is driven at a linear speed approximately equal to the peripheral speed of the portion of the cone near the mid portion of the belt so that there is little tendency of the cigarettes to roll.

The under side of the guard 78 is cut away on line 85 to permit the cigarettes on the delivery belt to pass. The spaces between disk 82 and guard 78, and between guard 78, which are cut away for this purpose as shown in Figs. 1 and 2, and the strip 79 are so dimensioned as to cause all cigarettes below a given length to drop out on their way around the drum, a chute 86 attached to frames 7 and 8

being provided to guide the same into a suitable receptacle.

For collecting oval cigarettes so that the printed sides face the same way after delivery the embodiment illustrated in Fig. 1 is employed as shown in Fig. 5. The guards 78 and 79 approach sufficiently close to the bottoms of the pockets formed by the conical surface of the catcher drum between said strips to positively prevent rotation of the oval cigarettes. To this end, the distances between the guards and the bottoms of the pockets will be less than the greater cross sectional dimension of the oval cigarette. Since this dimension is usually substantially greater than the diameter of round cigarettes the same catcher may be used without change for round cigarettes and certain common oval types. For others it is only necessary to change the distance between the guard and the cone.

Since the guard 78 extends under the belt 55 at the point where the belt extends under the conical drum, the oval cigarette cannot rotate as it is carried transversely off this belt. The position of the printed side of the oval cigarettes is thus under control from the time the cigarettes leave the cigarette machine proper to the time they are deposited on the transverse delivery belt. Since the drop on to this belt is a very slight one and the belt is traveling at approximately the same speed as the drum portion from which the cigarette falls and moreover due to the fact that delivery takes place at the small or apex end of the cone, the transverse speed at which the cigarettes are delivered is relatively small, there is little tendency for the cigarettes to roll and the oval cigarettes will rest thereon with the printed faces thereof all facing the same way.

The operation of the several parts has been set forth in connection with the description of the several parts but may be summarized as follows:—

The cigarettes are delivered by a pair of transfer belts 54 and 55 running at a speed faster than the cigarette rod to separate the cigarettes and thus propel them into the successive pockets formed by the strips 21 on the rotating conical drum 20. This conical drum rotates in a plane transverse to the path of the oncoming cigarettes so as to successively align the pockets at the under side of the cone with the path of the oncoming cigarettes. Stops are associated with the pockets at the point some distance from the receiving end of the pockets which serve to bring the longitudinal motion of the cigarettes to a halt at the same time that the cigarettes are being moved transversely away from the path of the following cigarettes.

An important advantage of applicant's construction is that due to the lateral movement of the pockets relative to longitudinal movement of the cigarettes there is considerable friction between the sides of the cigarettes and the strips 21 forming the walls of the pockets, so that in actual practice the cigarettes follow a spiral path for a considerable annular distance before reaching the stops at a substantially reduced longitudinal speed; thus even at high speeds there is little likelihood of the cigarettes being spoiled by damage to their ends. Due to the conical shape of the catcher drum with the base of the cone toward the cigarettes and to the inclination of its axis of rotation with respect to the horizontal path of the oncoming cigarettes, as the catcher drum rotates the pockets form inclines down which the cigarettes slide by gravity toward the apex of the cone until arrested by stop means associated with said pockets. Since the stop means of partitions 83 in alternate pockets are offset from the stop means 82 and are arranged to stop the cigarettes with their ends in alignment, the cigarettes when they reach the end of the retaining guard 78—79 will be deposited in two rows with the cigarettes in each row with their ends in alignment and in case of tipped cigarettes with the tips in each row pointing the same way.

What is claimed is:

1. The combination with a cigarette catcher having a series of cigarette pockets, of means for rotating said catcher to successively move said pockets into axial alignment with oncoming cigarettes and thence through an inclined position with respect thereto to delivery position.

2. The combination with a cigarette catcher having a series of cigarette pockets, of means for rotating said catcher to successively move said pockets into axial alignment with oncoming cigarettes and thence through an inclined position with respect thereto to delivery position, said catcher including a rotatable device on which the pockets are arranged in conical formation.

3. The combination with a cigarette catcher having a series of cigarette pockets, of means for rotating said catcher to successively move said pockets into axial alignment with oncoming cigarettes and thence through an inclined position with respect thereto to delivery position, said catcher including a conical drum with the pockets arranged side by side on the conical surface thereof.

4. The combination with a cigarette catcher having a series of cigarette pockets, of means for rotating said catcher to successively move said pockets into axial alignment with oncoming cigarettes and thence through an inclined position with respect thereto to delivery position, said catcher including a device carrying said pockets and rotating about an axis inclined with respect to the path of the oncoming cigarettes.

5. The combination with a cigarette

catcher having a series of cigarette pockets, of means for rotating said catcher to successively move said pockets into axial alignment with oncoming cigarettes and thence through an inclined position with respect thereto to delivery position, said catcher being positioned to overlie the path of the oncoming cigarettes.

6. The combination with a cigarette catcher having a series of cigarette pockets, of means for rotating said catcher to successively move said pockets into axial alignment with oncoming cigarettes and thence through an inclined position with respect thereto to delivery position, said catcher being positioned to overlie the path of the oncoming cigarettes and said means operating to carry the pockets over the axis of the catcher from receiving to delivery position.

7. The combination with a cigarette catcher having a series of cigarette pockets, of means for rotating said catcher to successively move said pockets into axial alignment with oncoming cigarettes and thence through an inclined position with respect thereto to delivery position, and a guard extending about said catcher from receiving to delivery position to retain cigarettes in said pockets.

8. The combination with a cigarette catcher having a series of cigarette pockets, of means for rotating said catcher to successively move said pockets into axial alignment with oncoming cigarettes and thence through an inclined position with respect thereto to delivery position, and a guard extending about said catcher said guard being cut away to permit shorts to drop out while retaining full length cigarettes in the pockets.

9. The combination with a cigarette catcher having a series of cigarette pockets, of means for rotating said catcher to successively move said pockets into axial alignment with oncoming cigarettes and thence through an inclined position with respect thereto to delivery position, and aligned cigarette stops associated with each of said pockets the stops in alternate pockets being longitudinally offset to align alternate cigarettes in separate rows.

10. The combination with a cigarette catcher having a series of cigarette pockets, of means for rotating said catcher about an axis inclined to the horizontal to successively move said pockets into axial alignment with oncoming cigarettes and thence through an inclined position with respect thereto to delivery position, said means operating said catcher to carry the pockets over the axis of the catcher from receiving to delivery position.

11. The combination with a cigarette catcher having a series of cigarette pockets, of means for rotating said catcher to successively move said pockets into axial alignment with oncoming cigarettes and thence through an inclined position with respect thereto to delivery position, and a belt for conveying the oncoming cigarettes extending under said catcher at receiving position.

12. A catcher element for cigarette collecting mechanisms comprising a rotating conical drum having a circumferential series of outstanding strips extending along the conical surface of said drum from the base toward the apex to form wedge shaped cigarette pockets thereon.

13. A catcher element for cigarette collecting mechanisms comprising a rotating conical drum having a circumferential series of outstanding strips extending along the conical surface of said drum from the base toward the apex to form wedge shaped cigarette pockets thereon, and transversely aligned partitions intermediate the ends of every other pocket.

14. The combination with a cigarette catcher having a series of cigarette pockets, of means for rotating said catcher to successively move said pockets into axial alignment with oncoming cigarettes, and means cooperating with said catcher to positively prevent rotation of oval cigarettes while in said pockets.

15. The combination with a cigarette catcher having a series of cigarette pockets, of means for rotating said catcher to successively move said pockets into position to receive the oncoming cigarettes, and a stationary guard extending about said catcher from receiving to delivery position and approaching sufficiently close to the bottom of said pockets to prevent rotation of oval cigarettes therein.

16. The combination with means for feeding aligned printed oval cigarettes longitudinally with the printed sides all facing the same way, of a catcher for receiving said cigarettes at a position in alignment with the path of oncoming cigarettes and moving them in plane transverse to said path to a delivery position, and means cooperating with said catcher to positively prevent rotation of said cigarettes from receiving to delivery position to deliver the cigarettes each with the printed side facing the same way.

17. The combination with means for feeding aligned printed oval cigarettes longitudinally with the printed sides all facing the same way, of a catcher for receiving said cigarettes at a position in alignment with the path of oncoming cigarettes and moving them in plane transverse to said path to a delivery position, and means cooperating with said catcher to positively prevent rotation of said cigarettes from receiving to delivery position to deliver the cigarettes each with the printed side facing the same way, said catcher having a series of cigarette pockets and said means

including a guard extending about said catcher from and including receiving position to delivery position and approaching sufficiently close to the bottom of said pockets to prevent oval cigarettes from turning therein.

18. The combination with means for feeding aligned printed oval cigarettes longitudinally with the printed sides all facing the same way, of a catcher for receiving said cigarettes at a position in alignment with the path of oncoming cigarettes and moving them in plane transverse to said path to a delivery position and means cooperating with said catcher to positively prevent rotation of said cigarettes from receiving to delivery position to deliver the cigarettes each with the printed side facing the same way, and a delivery belt extending transversely under said delivery position and means for driving said delivery belt at a speed approximately equal to that at which the cigarettes are delivered from the catcher.

19. The combination with a cigarette catcher having a series of cigarette pockets, of means for rotating said catcher to successively move said pockets into position to receive oncoming cigarettes, and means for positively preventing rotation of oval cigarettes therein, said pockets being positioned about the periphery of a cone and arranged to receive cigarettes near the base of the cone and deliver them at a slower peripheral speed near the apex thereof.

20. In a collector for continuous rod cigarette machines, the combination with a rotating drum having cigarette receivers about the periphery of said drum, mechanism for gripping oncoming cigarettes from the cigarette machine and forwarding them into said receivers, and driving means for said mechanism connected with said drum to forward the cigarettes in timed relation to the rotation of the drum.

21. In a collector for continuous rod cigarette machines, the combination with a rotating drum having cigarette receivers about the periphery of said drum, mechanism for gripping oncoming cigarettes from the cigarette machine and forwarding them into said receivers, and driving means for said mechanism connected with said drum to forward the cigarettes in timed relation to the rotation of the drum, said means operating to drive said gripping means at a speed greater than cigarette rod speed to separate the cigarettes.

22. In a collector for continuous rod cigarette machines, the combination with a rotating drum having cigarette receivers about the periphery of said drum, mechanism for gripping oncoming cigarettes from the cigarette machine and forwarding them into said receivers, driving means engaging said gripping means, and operating mechanism positively interconnecting said drum and driving means for causing said gripping mechanism to forward the cigarettes in timed relation to the rotation of the drum.

23. In a collector for continuous rod cigarette machines, the combination with a rotating drum having cigarette receivers about the periphery of said drum, mechanism for gripping oncoming cigarettes from the cigarette machine and forwarding them into said receivers, driving means engaging said gripping means, and operating mechanism positively interconnecting said drum and driving means for causing said gripping mechanism to forward the cigarettes in timed relation to the rotation of the drum, said gripping mechanism including opposed belts, and said driving means including a pulley in driving engagement with each of said belts, and a positive drive from the same source of motion to each of said pulleys and said drum.

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

WILHELM B. BRONANDER.