

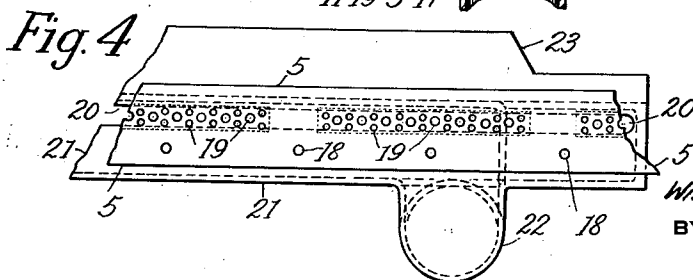
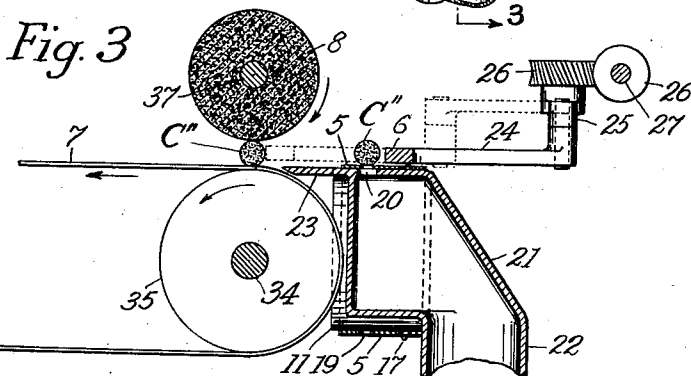
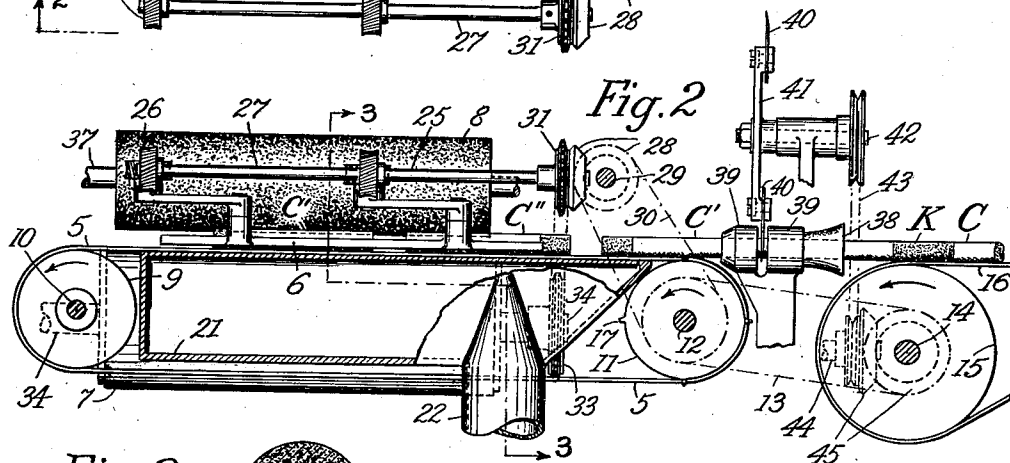
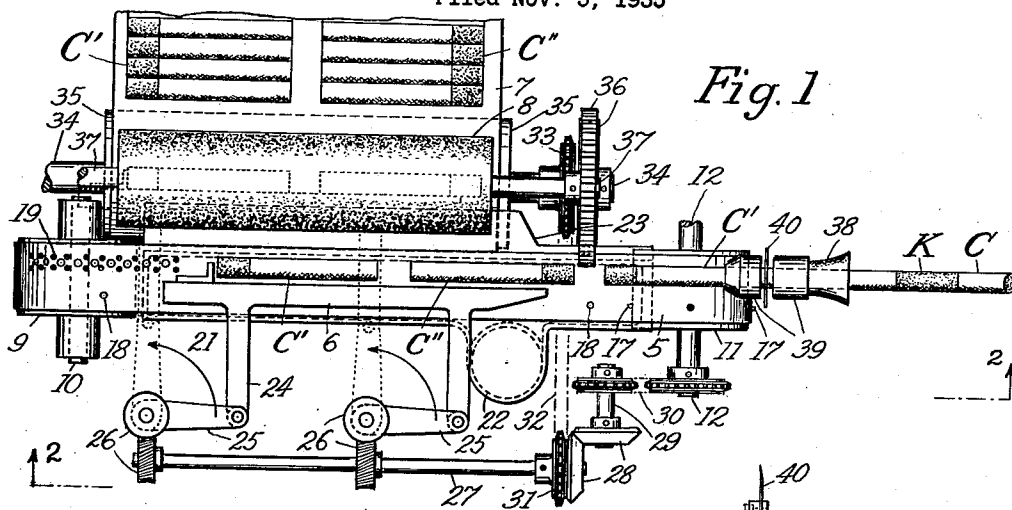
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W. B. BRONANDER

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CIGARETTE CATCHING MECHANISM

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INVENTOR
WILHELM B. BRONANDER
BY *George S. Hastings*
ATTORNEY

UNITED STATES PATENT OFFICE

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CIGARETTE CATCHING MECHANISM

Wilhelm B. Bronander, Montclair, N. J., assignor
to American Machine & Foundry Company, a
corporation of New Jersey

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This invention relates to improvements in continuous-rod cigarette machines, more particularly to the cigarette-catching mechanism thereof. The main object of the invention is to separate the cigarettes without injuring them as they issue in single file from the cigarette machine cut-off, and then successively halt the cigarettes and transfer them on to an endless collecting or delivery belt.

This object is achieved in the embodiment of the invention selected for illustration herein, by an endless suction belt driven at a greater linear speed than that of the cigarette rod and acting to accelerate the cigarettes to space them and then deliver them in front of a transfer which periodically pushes the separated cigarettes sideways on to a delivery belt and into the space between the latter and a friction roller mounted above the belt and rotating at the same linear speed. The contact of the transfer with the sides of the cigarettes acts to slightly reduce the momentum imparted to the cigarettes by the separating suction belt, and the engagement of the friction roller therewith acts to further retard and finally halt the endwise movement of the cigarettes as they pass sideways under the same. With this and other objects not specifically mentioned in view the invention consists in certain constructions and combinations hereinafter fully described and then specifically set forth in the claims hereunto appended.

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

Fig. 1 is a plan view of the improved cigarette catching mechanism;

Fig. 2 is a side elevation of the same viewed from line 2—2 of Fig. 1;

Fig. 3 is a sectional end elevation of the suction chamber and suction belt on line 3—3 of Fig. 2; and

Fig. 4 is a fragmentary plan view of the same.

Generally stated in the particular embodiment of the invention herein illustrated the cigarettes are received endwise from a cigarette machine cutoff and suctionally gripped and advanced at a speed greater than that of the cigarette rod to establish spaces therebetween. In the best constructions contemplated the cigarettes, as they issue from the cigarette machine cutoff, are engaged by a traveling suction belt, which may be perforated or formed of air-permeable material and runs over a slot in a suction chamber, acting to suctionally grip and advance the cigarettes.

The spaced cigarettes may be then pushed by a transfer of any suitable or desirable construction, while they are being forwarded by the suction belt, on to a traveling collecting belt whereon their endwise movement is retarded and halted by a rotating friction roller. This construction may be widely varied for the particular device 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 details illustrated and described, nor to the particular embodiment chosen as illustrative of the invention.

Referring to Figs. 1 to 3 of the drawing, the particular embodiment of the cigarette catching mechanism selected for illustration comprises a suction belt 5 running in the direction of and at a higher speed than the cigarette rod C; an orbitally moving pusher 6 periodically advancing to engage and displace a pair of cigarettes C', C''; an endless collecting belt 7 running at right angles to the direction of the cigarette rod; and a friction roll 8 rotating at the same linear speed as the collecting belt.

The suction belt 5 runs over an idler pulley 9 on a shaft 10 and is driven by a pulley 11 on a shaft 12 carrying a sprocket driven by a chain 13 from a sprocket on the shaft 14 of a wheel 15 which drives the rod-forming tape 16 propelling the cigarette rod C. The pulley 11 has a number of studs 17 which engage with holes 18 in one edge of the belt 5 to drive the latter without slipping. The belt 5 may also be provided with spaced groups of holes 19, Fig. 4, each group registering with one cigarette and all groups registering with a slot 20 in the top of a suction chamber 21 which has a duct connected to a suitable source of suction (not shown) and is provided with a projecting ledge 23.

The particular type of transfer selected for illustration herein comprises a pusher 6 having arms 24 which are connected to parallel cranks 25 on vertical crank shafts driven by spiral gears 26 from a shaft 27 driven by bevel gears 28 from a shaft 29 which carries a sprocket driven by a chain 30 from a sprocket on shaft 12. A sprocket 31 on shaft 27 drives a chain 32 running over a sprocket 33 on a shaft 34 on which the driving pulley 35 of the collecting belt 7 is mounted. The shaft 34, by means of intermeshing spur gears 36, also drives a shaft 37 which carries the friction roll 8, which is made of sponge rubber or other suitable material.

The cigarette rod C is propelled by the tape 16 into the bell-mouth 38 of the ledger tube 39

wherein the cigarette rod is cut into individual cigarettes by knives 40 on a rotating carrier 41, the same constituting a cigarette machine cutoff of well known type. Thus, the cigarettes are severed from the rod C by each knife 40 successively at each half revolution of the carrier 41. When the rod C' is provided with spaced cork strips K, by a cork-tipping mechanism (not shown) acting to apply the strips to the cigarette paper before it enters the rod-forming mechanism, the cuts are successively made in the centers of these strips and half-way between them, so that the cork tips of successive cigarettes issuing from the tube 39 point in opposite directions. The pusher 6 then delivers them in pairs on to the conveyor belt 7 in two parallel rows C' and C'' in each of which all the cork tips point in the same direction.

The knife carrier 41 is mounted on a shaft 42 arranged obliquely to the cigarette rod and driven by a belt 43 from a shaft 44 which, in turn, is driven from the tape-wheel shaft 14 by means of bevel gears 45. The shaft 14 thus imparts motion to all the working parts of mechanism, thereby insuring synchronism of their operation with the cigarette machine cutoff. It should be noted, however, that other types of cigarette machine cutoffs may be used instead.

As the cigarettes issue from the cigarette machine cutoff they register with successive groups of perforations 19 in the belt 5 and are suctionally retained thereon and accelerated to establish spaces therebetween and forwarded endwise in front of the pusher 5. Thereupon the latter pushes them sidewise individually, or in pairs as shown herein. This sidewise displacement of the cigarettes is begun while they are still being suctionally held on the belt 5, and they are pushed over the ledge 23 on to the belt 7. At this time the engagement of the friction roll 8 with the tops of the cigarettes being delivered to the belt 7 serves to retard and halt their endwise movement. Each group of perforations has the same length as a cigarette, and the ends of the latter register with ends of the perforated portion.

It is believed that the advantages of the present invention in avoiding injury to ends of the cigarettes by suctionally gripping them while spacing them should be explained. Since the cigarettes are retained on the suction belt by the suction applied to their bottoms, there is no tendency to crush their leading ends such as would arise when they enter between opposed traveling or relatively moving surfaces coacting to accelerate and space the cigarettes. Furthermore, it is evident that the registration of the groups of holes in the suction belt with the ends of the cigarettes prevents the removal of "shorts" from the cigarette ends, which would otherwise result if the groups of holes extended beyond the ends of their respective cigarettes and thus exposed the same to the action of the suction applied to the belt. However, it will be understood that the invention is not restricted to include perforated suction belts having such registration with the cigarette ends, as the crushing of the same will be avoided even though the belt is formed of unperforated air-permeable material or the holes in the suction belt are out of registry therewith. For this purpose the belt may be formed of porous material.

What is claimed is:

1. In a cigarette catching mechanism, the combination with means arranged to receive ciga-

rettes issuing endwise from a cigarette machine cutoff, wherein they are severed from a traveling cigarette rod, and suctionally grip and advance the cigarettes at a speed greater than the linear speed of the cigarette rod to establish spaces therebetween, a traveling collecting belt, a device for pushing the separated cigarettes sidewise on to said belt while said means is acting to suctionally grip and advance the same, and a member arranged to engage the top of the cigarettes while they are being pushed on to said belt and thereby retard and halt the endwise movement of the cigarettes.

2. In a cigarette catching mechanism, the combination with means arranged to receive cigarettes issuing endwise from a cigarette machine cutoff, wherein they are severed from a traveling cigarette rod, and suctionally grip and advance the cigarettes at a speed greater than the linear speed of the cigarette rod to establish spaces therebetween, a traveling collecting belt, a device for pushing the separated cigarettes sidewise on to said belt while said means is acting to suctionally grip and advance the same, and a member arranged to engage the top of the cigarettes while they are being pushed on to said belt and thereby retard and halt the endwise movement of the cigarettes, said means including a traveling endless suction belt provided with spaced groups of holes arranged to successively coincide with the cigarettes delivered from the cigarette machine cutoff, and a suction chamber arranged below said belt and provided with a slot extending along the same to retain the cigarettes on the groups of holes with which they coincide.

3. In a cigarette catching mechanism, the combination with means arranged to receive cigarettes issuing endwise from a cigarette machine cutoff, wherein they are severed from a traveling cigarette rod, and suctionally grip and advance the cigarettes at a speed greater than the linear speed of the cigarette rod to establish spaces therebetween, a traveling collecting belt, a device for pushing the separated cigarettes sidewise on to said belt while said means is acting to suctionally grip and advance the same, a member arranged to engage the top of the cigarettes while they are being pushed on to said belt and thereby retard and halt the endwise movement of the cigarettes, said means including an endless suction belt provided with spaced groups of holes arranged to coincide successively with the cigarettes delivered from the cigarette machine cutoff and further provided with equally spaced holes along one of its edges, driven and idler pulleys over which said belt is trained, studs on the driven pulley arranged to successively engage the holes at the edge of the belt and thereby positively drive the same, and a suction chamber provided with an elongated slot extending along the inner face of the operating run of said belt to suctionally retain the cigarettes on the groups of holes with which they coincide.

4. The combination with means arranged to receive cigarettes issuing endwise from a cigarette machine cutoff, wherein they are severed from a traveling cigarette rod, and suctionally grip and advance them endwise at a speed greater than the linear speed of the cigarette rod to establish spaces therebetween, a device for pushing the spaced cigarettes sidewise to remove them from said means while the latter is acting to suctionally grip and advance the cigarettes, means supporting the cigarettes as they are displaced

sidewise, and a member arranged to engage the top of the cigarettes while they are being pushed sidewise and thereby retard and halt the endwise movement of the same.

5 5. The combination with means arranged to receive cigarettes issuing endwise from a cigarette machine cutoff wherein they are severed from a traveling cigarette rod and suctionally grip and advance them endwise at a linear speed greater than the linear speed of the cigarette rod to establish spaces therebetween, and a device for pushing the spaced cigarettes sidewise to remove them from said means while the latter is acting to suctionally grip and advance the cigarettes.

10 6. A cigarette collector comprising the combination with a continuously traveling endless suction belt provided with spaced groups of holes arranged to successively coincide with cigarettes delivered endwise from a cigarette machine cutoff, of a suction chamber arranged within said belt and provided with a slot extending along the same to retain the cigarettes on the groups of holes with which they coincide.

20 7. The combination with an endless suction belt provided with spaced groups of holes arranged to coincide successively with the cigarettes delivered endwise from a cigarette machine cutoff and further provided with equally spaced holes along one of its edges, driven and idler pulleys over which said belt is trained, studs on the driven pulley arranged to successively engage the holes at the edge of the belt and thereby positively drive the same, and a suction chamber provided with an elongated slot extending along the inner face of the operating run of said belt to suctionally retain the cigarettes on the groups of holes with which they coincide.

5 8. In a continuous rod cigarette machine having a cigarette machine cutoff operating to sever cigarettes from a traveling cigarette rod, the combination of means arranged to receive the cigarettes endwise from said cutoff and suctionally grip and advance them endwise at a speed greater than the linear speed of the cigarette rod to establish spaces therebetween, a device for pushing the spaced cigarettes sidewise to remove them from said means while they are being suctionally gripped and advanced, and a member arranged to engage the top of the cigarettes while they are being pushed sidewise and thereby retard and halt the endwise movement of the same.

10 15 20 25

WILHELM B. BRONANDER.