

Sept. 21, 1937.

G. W. GWINN

2,093,437

CIGARETTE COLLECTOR

Original Filed Nov. 15, 1933 2 Sheets-Sheet 1

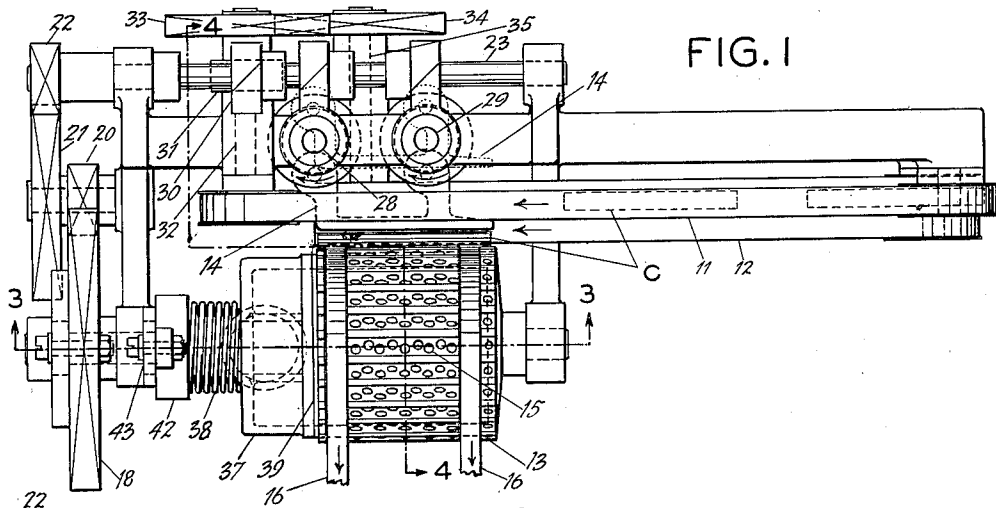


FIG. 1

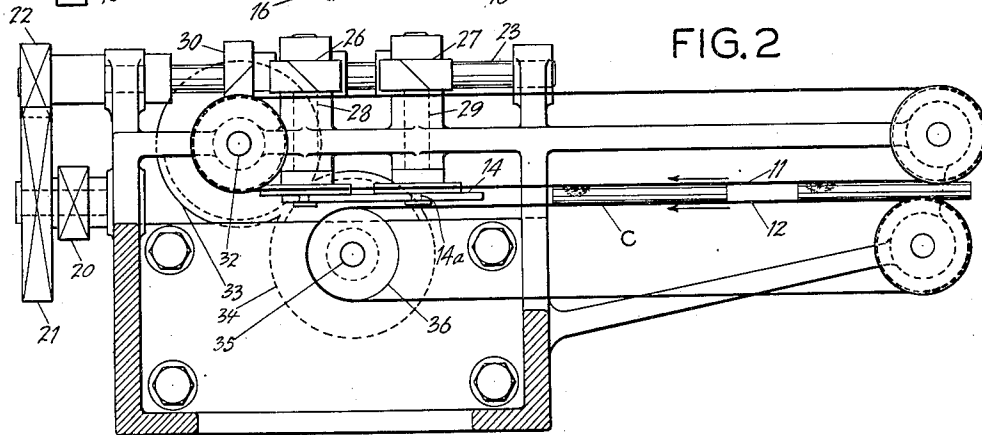


FIG. 2

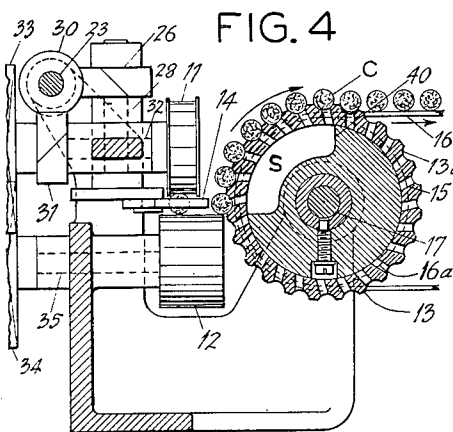


FIG. 4

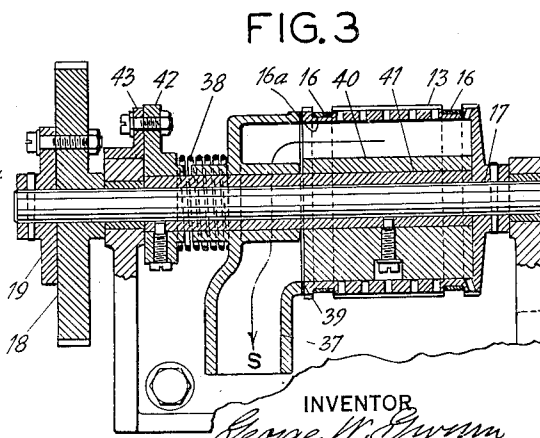


FIG. 3

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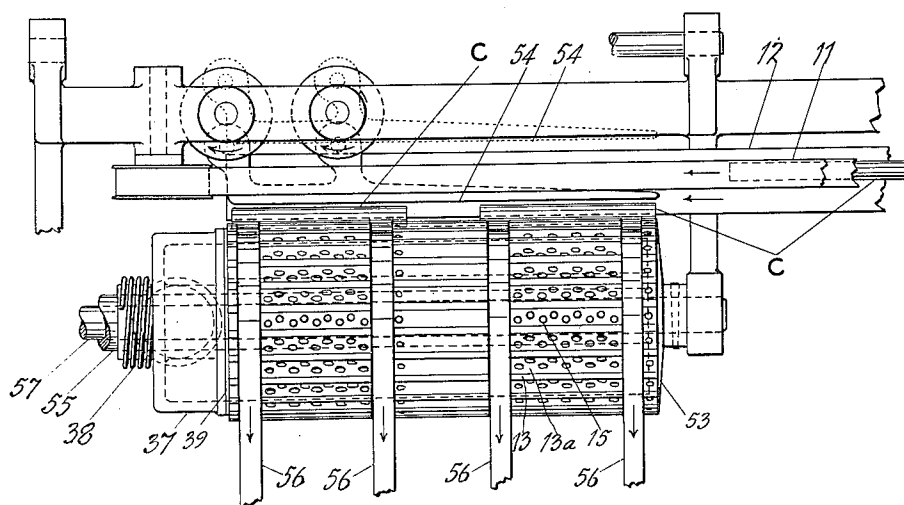
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FIG. 5



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CIGARETTE COLLECTOR

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Renewed February 20, 1935

28 Claims. (Cl. 198—25)

This invention relates to cigarette collectors for continuous rod cigarette machines and is intended to receive the cigarettes as they issue in a single line from the cutoff and deliver them in side by side row formation.

There are many devices for this purpose but, when used at high speed, most of them are either too severe in their treatment of the cigarettes and especially the ends of the cigarettes, or they fail to lay the cigarettes down in reasonably exact alignment and parallelism. The principal object of the invention is to provide a collector which will overcome these difficulties and which will be capable of use at the highest speeds of which cigarette machines are capable. To this end it is an object of the invention to provide a collector in which the endwise travel of the cigarettes is retarded by the gentle action of suction, instead of by the mechanical resistance of a stop, with necessarily harsh action on the ends of cigarettes traveling at high speed.

Still another important object is to provide for accurate placing and aligning of the cigarettes without however the use of pocket walls to segregate and position cigarettes. In the latter type of machine, while alignment is commonly good, the pocket walls are a source of considerable trouble when the cigarettes for any reason open up or the cutoff is out of time with the collector because at the point where the ends of the walls pass the line of cigarettes, under such circumstances, a windmill action takes place which tangles up and scatters cigarettes and tobacco. The present device makes it possible to eliminate such pocket walls or partitions and at the same time holds the cigarettes in exactly separated spaced positions for accurate spacing and alignment on the delivery belt.

Another object of the invention is to insure a clear cut separation of cigarettes and a firm grip on the cigarettes by the suction means through the shaping of the cigarette engaging portion of the suction means and through the positive engaging of the cigarettes with the suction means. Another object of the invention is to provide a collector which will deliver cigarettes with the seam side or the printed side of successive cigarettes facing in the same direction thus eliminating elaborate devices often hitherto used to obtain this uniformity ordinarily lost in the collector. In this connection it is an object to maintain the uniform rotational arrangement of round as well as oval cigarettes. 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 hereunto appended. In the accompanying drawings in which like characters of reference indicate the same or like parts,

Fig. 1 is a plan view of the improved collector;

Fig. 2 is a sectional side elevation of the cigarette collector, omitting the suction drum to show the parts behind;

Fig. 3 is a detail view in sectional elevation of the suction drum on the line 3—3 of Fig. 1;

Fig. 4 is a section in elevation on the line 4—4 of Fig. 1;

Fig. 5 illustrates a modified form of the invention for delivering aligned cigarettes in two rows.

In carrying the invention into effect, there is provided in a cigarette collector, a combination of devices for delivering a line of endwise moving cigarettes, with suction means which are relatively stationary with respect to the endwise movement of the cigarettes and which act as a brake on said cigarettes to retard or stop their endwise movement. In the best constructions said suction means comprises a rotating suction drum and preferably the rotating suction drum has suction ports arranged to extend alongside the line of cigarettes. In the best forms, means are provided for positively pushing the cigarettes from the endwise moving line into contact with said suction ports.

Referring now to Figs. 1 to 4 of the drawings, the cigarettes C as they are delivered in an endwise moving line from the cutoff, (not shown) of a continuous rod cigarette machine, are forwarded between upper and lower belts 11 and 12. These belts travel at a speed greater than that of the cigarette rod in order to space the successive cigarettes. Cigarettes are forwarded by these belts alongside the collector drum 13 which has a series of grooves 13a parallel to its axis on its periphery, which grooves communicate through suction ports 15 with a suction chamber S within the drum which is of hollow cylindrical construction. The drum while rotatable transversely of the line of cigarettes, is immovable lengthwise of the line so that the suction through ports 15 as it draws the cigarettes up against the drum acts as a gentle but efficient brake on the endwise travel of the cigarettes. In this connection it is noted that the rapidly moving cigarettes are not brought against a rigid stop to halt the cigarettes and hence there is no danger of injuring the ends of the cigarettes.

While the cigarettes may be forwarded in close contact with the drum for removal by suction alone, in a preferred form a pusher is provided for positively seating the cigarettes in the grooves 13a and against the suction ports. The advantage of employing grooves with suction ports in their bottoms is that the cigarettes are engaged for a considerable portion of their circumference instead of along a single line of contact.

As the drum 13 rotates, the pusher 14 forces the cigarettes against the suction ports and the drum carries the cigarettes a quarter turn to a position where said cigarettes are picked off by delivery belts 16 and transported to a stationary table, where the cigarettes are arranged in side by side accurately aligned formation which facilitates inspection and packaging and enables the operator to handle more cigarettes per minute than otherwise possible. The suction drum 13 is secured to one end of a shaft 17. On the other end of this shaft is a gear 18 adjustably attached to a hub 19 which is secured to the shaft 17. The shaft 17 is driven through gears 18, 20, and 21 from gear 22 on the shaft 23 which gears establish a ratio of 1 to 24 between the shafts 17 and 23 for a drum having 24 cigarette receiving grooves, so that a groove comes opposite the cigarette line for each cigarette forwarded.

The pusher 14 is given an orbital movement toward and across the cigarette line while moving along said line, then away from the line and so on, and for this purpose is secured on cranks 14a on the shafts 28 and 29 which are driven through spiral gears 24 and 25 on shaft 23 engaging with spiral gears 26 and 27 on the shafts 28 and 29, shafts 23 and 28 and 29 being driven at a 1 to 1 ratio such that there is one cigarette pushed for every cycle of operation of the cigarette machine. This shaft 23 through a spiral gear 30 drives the spiral gear 31 on shaft 32 which in turn drives the guide belt 11 as already described. A gear 33 on the shaft 32 through gear 34 on the shaft 35 and pulley 36 drives the lower guide belt 12 at the same speed as the guide belt 11. A suction conduit and chamber S connects with the hollow interior of the collector drum 13 as shown in Fig. 3, through a manifold sleeve 37 which is held by the pressure of a spring 38 in substantially air tight relation to a flange 39 on the drum 13. A valve 40 on the valve stem 41 is adjustably secured by arm 42 to a bracket 43 which serves to hold the valve stationary against movement with the drum. As shown in Fig. 4, the suction chamber S formed by the valve and conduit is so arranged that the limits of the suction chamber act to turn on suction to the ports 15 at a point just preceding the receiving of a cigarette from the delivery belts 11 and 12 and cuts off the suction at the point where the cigarettes are delivered from the drum about ninety degrees from the first mentioned point onto the delivery belt 16. It is noted that the delivery belt 16 runs in grooves 16a in the suction drum so that the belts do not interfere with the action of the grooves 15 and yet underlie the cigarettes so as to produce a gradual but positive separation thereof at the delivery position. These belts being spaced, permit shorts and cigarette pieces to drop out between the cigarettes and thus act as an automatic inspection device for such defective cigarettes.

Referring now to Fig. 5, a modified form of the invention is shown for the purpose of delivering aligned cigarettes in two rows with the cigarettes arranged side by side. The construction of this

form is substantially the same as that shown in Figs. 1 to 4 except that the drum 53 is made somewhat more than twice as long and is provided with two circumferential sets of grooves 13a and ports 15. The pusher 54 extends alongside both sets of grooves and is timed to operate once every second cycle of the cigarette machine to push two cigarettes at a time into contact with the two sets of suction grooves which are delivered by two sets of side delivery belts 56 in rows. The drum 53 is carried by the shaft 57, which also carries the valve stem 55. In this form, the drum 53 is rotated at a speed such that aligned grooves 13a arrive in cigarette receiving position once during the forwarding of every two cigarettes. In the form shown, this is attained by driving the drum 53 at one half the speed at which the drum 13 is driven.

The form shown in Fig. 5 is particularly useful for the delivery of cork tipped cigarettes and for use with very high speed cigarettes machines where one girl cannot take care of the delivery in one row.

It is noted that by reason of the suction principle employed in the present device, a machine has been provided which is gentle in its action on the cigarettes by reason of the fact that any sudden halting of the cigarettes against a stop engaging the ends is eliminated. It is noted that the present collector has no deep pockets or partitions extending between successive cigarettes and so that there is no likelihood of cigarettes when fed opened up or out of time with the cigarette machine becoming caught or mangled between partition walls or scattered windmill fashion by said walls and that the structure is substantially self-clearing since it has no parts on which cigarettes or shorts may be caught. Another advantage over the present construction as compared with one with partition walls is that it may be of relatively small diameter as compared with the pocket wall construction in which the walls must be made far enough apart to secure complete entry of the cigarette between said walls. While the present invention has been described in connection with a drum type collector, it should be understood that the invention is applicable to other types of collectors. The parts above described 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 possible concrete embodiments of the same. The invention therefore is not to be restricted to the precise details of the structure shown and described.

What is claimed is:

1. The combination with the cigarette forwarding device of a cigarette machine, of suction mechanism operative in fixed location alongside said device for retarding and removing the forwarded cigarettes, said device including means for giving the forwarded cigarettes a sidewise movement during their forward movement to move them into contact with said mechanism.

2. The combination with the cigarette forwarding device of a cigarette machine, of suction mechanism operative in fixed location alongside said device for retarding and removing the forwarded cigarettes, said device including a cigarette supporting belt running alongside said mechanism, and means operating over said belt for giving the forwarded cigarettes a sidewise movement during their forward movement to move them into contact with said mechanism.

3. The combination with the cigarette forwarding device of a cigarette machine, of mechanism operative in fixed location alongside said device for retarding and removing the forwarded cigarettes by suction, said mechanism including a moving member having a series of longitudinal grooves, and means for establishing suction in said grooves to hold the cigarettes therein.

4. The combination with the cigarette forwarding device of a cigarette machine, of mechanism operative in fixed location alongside said device for retarding and removing the forwarded cigarettes by suction, said mechanism including a moving member having a series of longitudinal grooves, means for establishing suction in said grooves to hold the cigarettes therein, and means for cutting off the suction to release the cigarettes.

5. The combination with the cigarette forwarding device of a cigarette machine, of mechanism operative in fixed location alongside said device for retarding and removing the forwarded cigarettes by suction, said mechanism including a moving member having a series of longitudinal grooves, means for establishing suction in said grooves to hold the cigarettes therein, and means for removing the cigarettes from said grooves.

6. The combination with the cigarette forwarding device of a cigarette machine, of mechanism operative in fixed location alongside said device for retarding and removing the forwarded cigarettes by suction, said mechanism including a moving member having a series of longitudinal grooves, means for establishing suction in said grooves to hold the cigarettes therein, means for cutting off the suction to release the cigarettes, and means for removing the released cigarettes from said grooves.

7. The combination with the cigarette forwarding device of a cigarette machine, of mechanism operative in fixed location alongside said device for retarding and removing the forwarded cigarettes by suction, said mechanism including a rotating drum having a series of longitudinal grooves at its periphery, and means for establishing suction in said grooves to hold the cigarettes therein.

8. The combination with the cigarette forwarding device of a cigarette machine, of mechanism operative in fixed location alongside said device for retarding and removing the forwarded cigarettes by suction, said mechanism including a rotating drum having a series of longitudinal grooves at its periphery, means for establishing suction in said grooves to hold the cigarettes therein, and means for cutting off the suction to release the cigarettes.

9. The combination with the cigarette forwarding device of a cigarette machine, of mechanism operative in fixed location alongside said device for retarding and removing the forwarded cigarettes by suction, said mechanism including a rotating drum having a series of longitudinal grooves at its periphery, means for establishing suction in said grooves, means for cutting off the suction to release the cigarettes, and means for removing the released cigarettes from said grooves.

10. The combination with the cigarette forwarding device of a cigarette machine, of mechanism operative in fixed location alongside said device for retarding and removing the forwarded cigarettes by suction, said mechanism including a rotating drum having a series of longitudinal grooves at its periphery, each groove being

in open communication with the interior of said drum through apertures in the drum wall, and means for establishing suction in the drum and grooves to hold the cigarettes in said grooves.

11. The combination with the cigarette forwarding device of a cigarette machine, of mechanism operative in fixed location alongside said device for retarding and removing the forwarded cigarettes by suction, said mechanism including a rotating drum having a series of longitudinal grooves at its periphery, each groove being in open communication with the interior of said drum through apertures in the drum wall, means for establishing suction in the drum and grooves to hold the cigarettes in said grooves, and means within said drum for cutting off the suction to release the cigarettes.

12. The combination with the cigarette forwarding device of a cigarette machine, of mechanism operative in fixed location alongside said device for retarding and removing the forwarded cigarettes by suction, said mechanism including a rotating drum having a series of longitudinal grooves at its periphery, each groove being in open communication with the interior of said drum through apertures in the drum wall, means for establishing suction in the drum and grooves to hold the cigarettes in said grooves, and a stationary valve within said drum for cutting off the suction to release the cigarettes.

13. In a cigarette making machine, the combination with a device for spacing endwise moving cigarettes longitudinally, of means coacting therewith for collecting the cigarettes side by side including a member having transversely moving suction areas for retarding and removing the cigarettes from said device.

14. In a cigarette making machine, the combination with a device for spacing endwise moving cigarettes longitudinally, of means coacting therewith for collecting the cigarettes side by side including a rotating drum having transversely moving suction areas for retarding and removing the cigarettes from said device.

15. In a cigarette making machine the combination with a device for spacing endwise moving cigarettes longitudinally, of means coacting therewith for collecting the cigarettes side by side including a member having transversely moving suction areas for retarding and removing the cigarettes from said device, and mechanism for cutting off the suction to release the removed cigarettes.

16. In a cigarette making machine, the combination with a device for spacing endwise moving cigarettes longitudinally, of means coacting therewith for collecting the cigarettes side by side including a rotating drum having transversely moving suction areas for retarding and removing the cigarettes from said device, and mechanism within said drum for cutting off the suction to release the removed cigarettes.

17. In a cigarette making machine, the combination with a device for spacing endwise moving cigarettes longitudinally, of means coacting therewith for collecting the cigarettes side by side including a rotating drum having transversely moving grooves provided with suction areas for retarding and removing the cigarettes from said device.

18. In a cigarette making machine, the combination with a device for spacing endwise moving cigarettes longitudinally, of means coacting therewith for collecting the cigarettes side by side including a rotating drum having trans-

versely moving grooves provided with suction areas for retarding and removing the cigarettes from said device, and mechanism within said drum for cutting off the suction to release the removed cigarettes.

19. In a cigarette making machine, the combination with a device for spacing endwise moving cigarettes longitudinally, of means coacting therewith for collecting the cigarettes side by side including a member having transversely moving suction areas for retarding and removing the cigarettes from said device, and collecting means receiving the cigarettes from said member.

20. In a cigarette making machine, the combination with a device for spacing endwise moving cigarettes longitudinally, of means coacting therewith for collecting the cigarettes side by side including a member having transversely moving suction areas for retarding and removing the cigarettes from said device, and collecting means including belts associated with and receiving the cigarettes from said member.

21. The combination with means for accelerating cigarettes delivered from a cigarette machine cutoff in end-to-end relation and thereby separating them lengthwise, of means for displacing the separated cigarette sidewise, and mechanism for suctionally retarding their endwise movement.

22. In a cigarette collector, the combination with devices delivering a line of endwise moving cigarettes, of means having suction ports extending alongside said line in close proximity to retard the longitudinal movement of said cigarettes, and means including a cigarette engaging element having movement toward, along and away from said line for pushing the cigarettes sidewise into contact with said means, and a source of suction connected to the ports of said means.

23. In a cigarette collector for collecting cigarettes from a succession of endwise moving cigarettes, the combination with a delivery belt movable in a direction transverse to the endwise movement of the cigarettes, a moving cigarette carrier having cigarette receiving portions for receiving a cigarette from said succession and delivering a cigarette onto said delivery belt, suction openings communicating with said receiving portions and suction conduits connecting to said openings for producing suction at the openings to hold the cigarettes on said carrier against rotation or loss of rotational position to deliver cigarettes with the seams thereof facing the same way relative to each other as received and means for delivering the cigarettes of said succession into the range of action of the suction at said openings.

24. In a cigarette collector, the combination with means for delivering a succession of cigarettes endwise in a line, of a cigarette conveying drum for receiving cigarettes from said succession and displacing them sidewise, and means coacting with said drum and the cigarettes thereon to prevent the rotation of round cigarettes

relative to the drum during the entire period said cigarettes are carried by the drum.

25. In a cigarette collector, the combination with means for delivering a succession of cigarettes endwise in a line, and a transversely extending cigarette supporting means, of means including a rotating cigarette carrier for receiving round cigarettes from said succession, displacing them sidewise from said line and delivering them onto said supporting means, and means coacting with said carrier and the round cigarettes thereon to prevent round cigarettes from rotating relative to the carrier, said carrier and supporting means being so arranged that the carrier delivers the cigarettes onto said supporting means with successive cigarettes in the same rotational position relative to each other as when received by said carrier.

26. In a cigarette collector, the combination with means for delivering a succession of cigarettes endwise in a line, transversely travelling endless conveyor means for receiving a supply of said cigarettes, a moving cigarette carrier interposed between said succession and said endless conveyor arranged to deliver cigarettes onto said conveyor, means coacting with said carrier and the round cigarettes thereon to prevent round cigarettes from rotating as long as the same are in contact with said carrier, said endless conveyor being arranged with a horizontal supporting surface thereof in contacting relation with the cigarettes as they are delivered from said carrier to avoid rotation thereof as the same are delivered.

27. In a cigarette collector, the combination with means for delivering a succession of cigarettes endwise in a line, transversely travelling endless conveyor means for receiving a supply of said cigarettes, a moving cigarette carrier interposed between said succession and said endless conveyor arranged to deliver cigarettes onto said conveyor, means coacting with said carrier and the round cigarettes thereon to prevent round cigarettes from rotating as long as the same are in contact with said carrier, said endless conveyor being arranged with a horizontal supporting surface thereof in contacting relation with the cigarettes as they are delivered from said carrier to avoid rotation thereof as the same are delivered, said carrier being peripherally grooved, and said conveyor means entering said grooved portion of the conveyor.

28. In a cigarette collector for acting on a succession of endwise moving cigarettes, the combination with a cigarette receiving support moving transversely of the direction of movement of said succession, of a rotary carrier rotatable about its own axis and having a plurality of cigarette receiving portions arranged to deliver cigarettes onto said support, suction ports communicating with said portions to hold a cigarette thereon, and means for forwarding the cigarettes of said succession into the range of action of said suction ports.

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