

April 30, 1935.

R. F. MAY

1,999,910

MANUFACTURE OF CIGARETTES

Filed Oct. 17, 1934

4 Sheets-Sheet 1

Fig. 1.

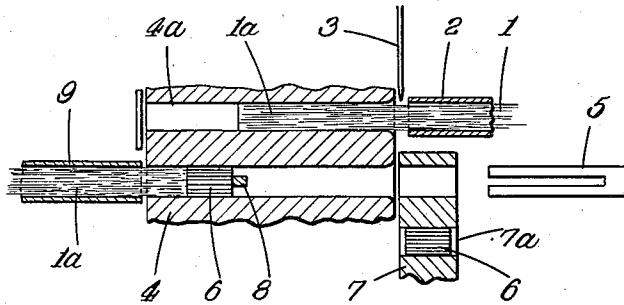


Fig. 2.

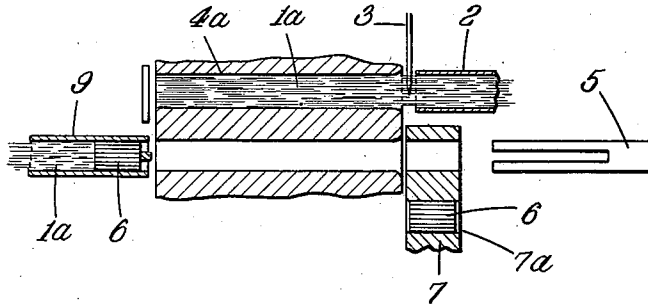
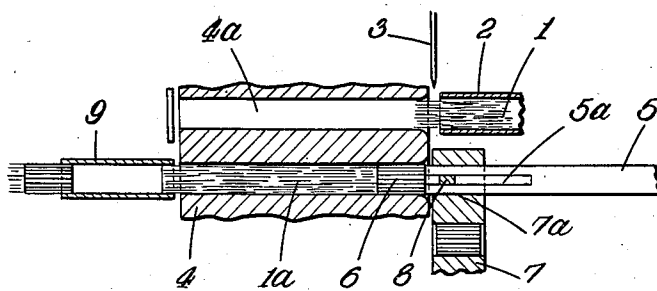


Fig. 3.



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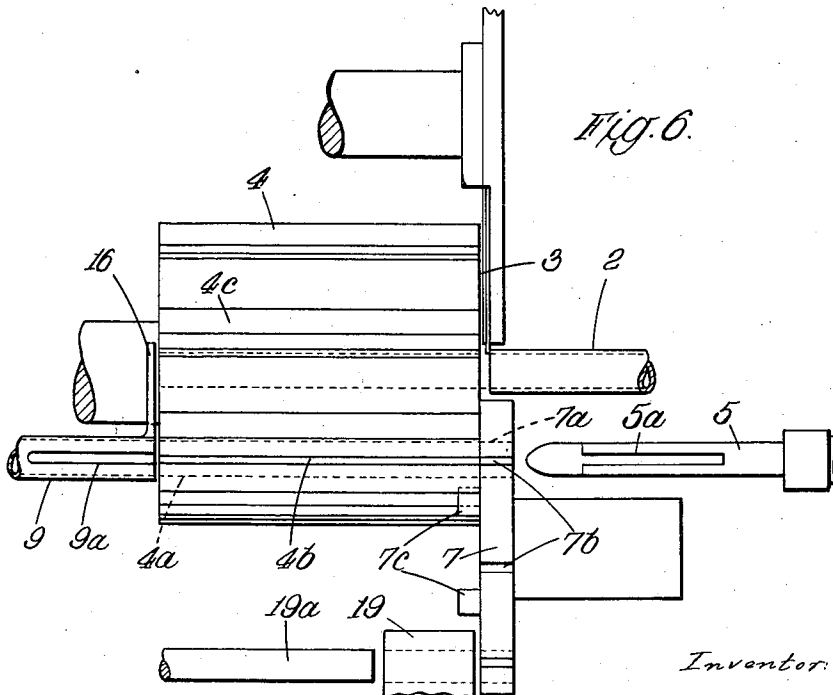
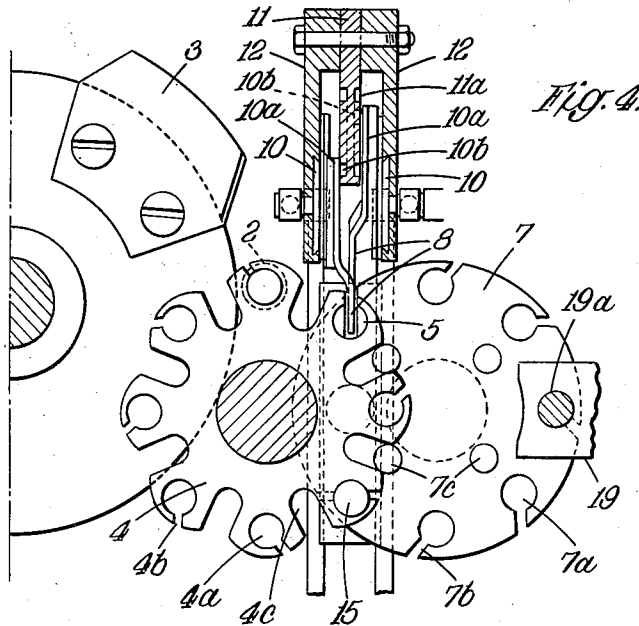
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MANUFACTURE OF CIGARETTES

Filed Oct. 17, 1934

4 Sheets-Sheet 2



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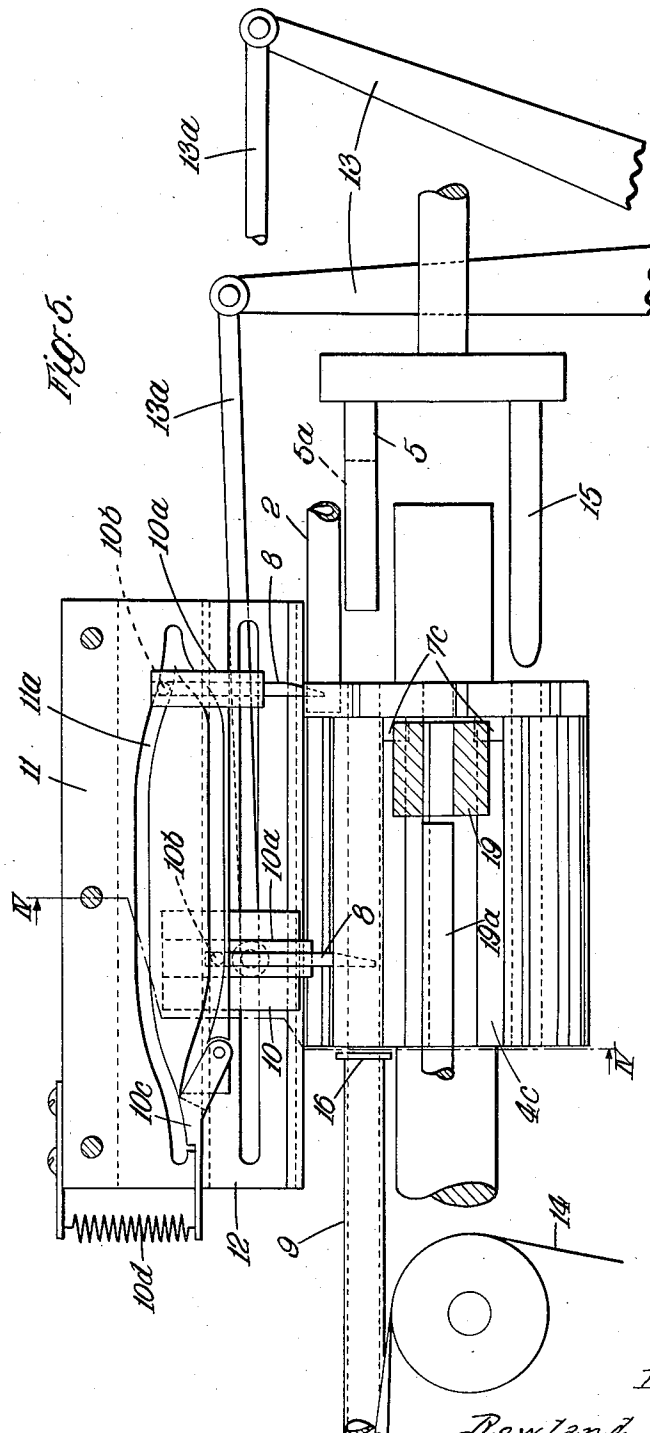
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MANUFACTURE OF CIGARETTES

Filed Oct. 17, 1934

4 Sheets-Sheet 3



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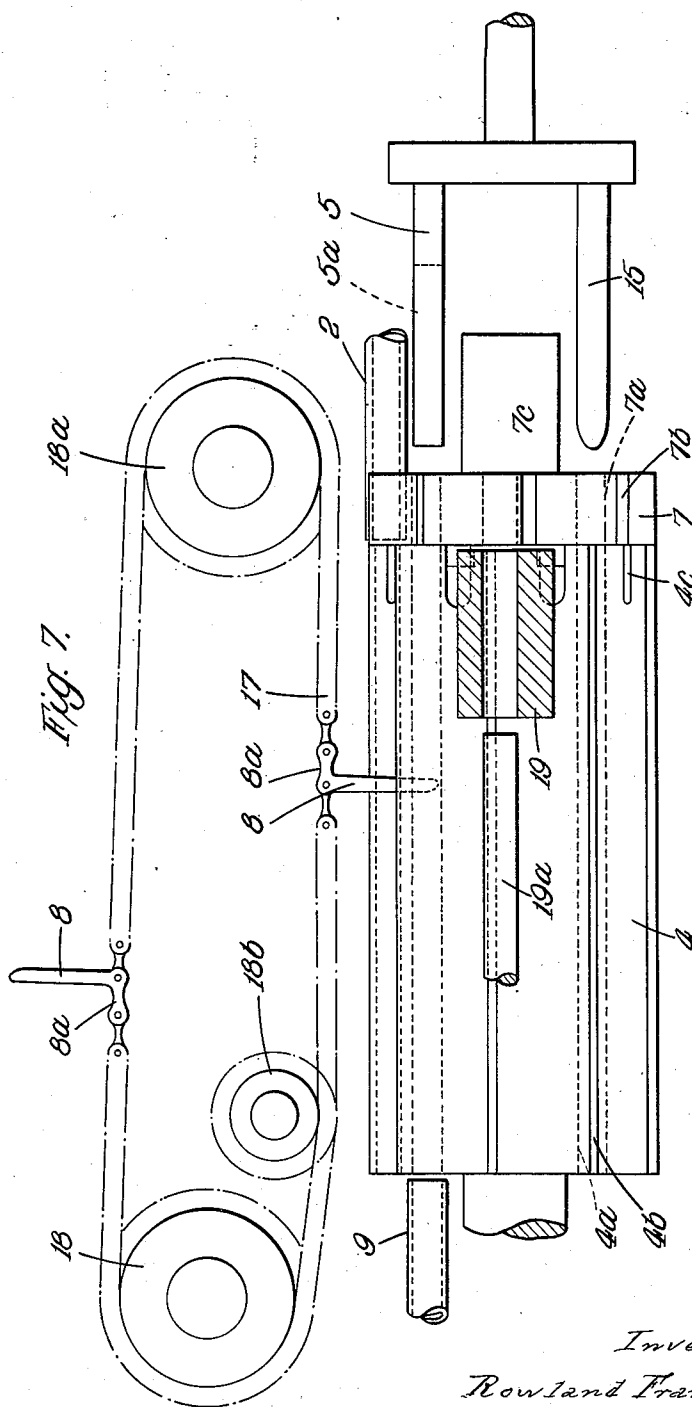
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MANUFACTURE OF CIGARETTES

Filed Oct. 17, 1934

4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

1,999,910

MANUFACTURE OF CIGARETTES

Rowland Frank May, Middlesex, England, as-
signor to Filter Tips Limited, London, England,
a British company

Application October 17, 1934, Serial No. 748,745
In Great Britain July 14, 1933

16 Claims. (Cl. 131—5)

This invention relates to the manufacture of cigarettes provided with filter tips or like stub portions.

The invention has for its primary object to provide an improved apparatus for producing such cigarettes on the continuous rod principle, i. e. by applying a continuous paper wrapper around a filling consisting of alternate lengths of tobacco and filter tips or stub portions.

According to the present invention, an apparatus is provided which comprises means for cutting successive lengths from a continuous tobacco rod, an intermittently movable carrier by which the lengths of tobacco so cut off are carried laterally out of alignment with the continuous tobacco rod, means for associating filter tips or like stub portions with the lengths of tobacco while disposed in the said carrier, and means for conveying the associated lengths of tobacco and filter tips or stub portions axially into engagement with mechanism for applying a continuous paper strip thereto for the production of a continuous cigarette rod, the carrier advantageously consisting of an intermittently rotatable drum having parallel bores or chambers for the reception of the lengths of tobacco.

In a preferred embodiment an intermittently rotatable disc having parallel bores or chambers therein is arranged so that at one position the bores or chambers in the disc register with the bores or chambers in the drum so as to bring a length of tobacco and a filter tip or stub portion into alignment, means being provided for axially ejecting the length of tobacco and the filter tip or stub portion from the aligned bores or chambers.

The apparatus may be adapted to receive and associate together lengths of tobacco and filter tips or stub portions of double the normal length, the cutter of the cigarette rod-forming mechanism being arranged to bisect the lengths of tobacco and the filter tips or stub portions.

The means for conveying or ejecting the associated lengths of tobacco and filter tips or stub portions into engagement with the cigarette rod-forming mechanism may comprise two reciprocating picker devices operating alternately through slots in the carrier or drum to eject the associated lengths therefrom. In one construction the picker devices may be mounted so as to be slidable vertically upon longitudinally reciprocable slides and are caused, as by the provision of cam track and roller mechanism, to move clear of the carrier and of each other on the return

stroke. Alternatively, the picker devices may be mounted upon an endless chain.

The linear speed of the cigarette rod-forming means is greater than the linear speed of the tobacco rod-forming means so as to compensate for the additional length introduced by the filter tips or stub portions and the associated lengths of tobacco and filter tips or stub portions are preferably conveyed into engagement with the cigarette rod-forming means in such manner that the successive associated lengths are caused to abut against the preceding lengths.

The invention is hereinafter described by way of example with reference to the accompanying diagrammatic drawings, in which:—

Figures 1, 2 and 3 are fragmentary sectional plan views illustrating one embodiment of the present invention.

Figure 4 is a cross-sectional view on the line IV—IV, Figure 5, illustrating one embodiment of apparatus for carrying out the invention;

Figure 5 is a side elevation corresponding to Figure 4 with one side plate of the picker mechanism removed to show the parts more clearly;

Figure 6 is a plan view corresponding to Figure 5, but with the picker mechanism removed; and

Figure 7 is a side elevation of a modified form of the invention.

In carrying the invention into effect and with reference more particularly to Figures 1, 2 and 3 of the accompanying diagrammatic drawings, the leading length 1a of a continuous tobacco rod issuing from the collector tube 2 of any suitable tobacco rod-forming apparatus is cut off by a cutter 3 after being received into a bore or chamber 4a in an intermittently movable carrier 4, and the length 1a cut off (Figure 2) is carried laterally by the movement of the carrier 4 into a position parallel with the continuous tobacco rod 1 and in alignment with a plunger 5 by which a filter tip or stub portion 6 is ejected from a chamber 7a in a carrier 7 so as to abut against the length 1a of tobacco (Figure 3). A picker 8 thereupon comes into engagement behind the filter tip or stub portion 6, the plunger 5 being provided with a slot 5a to accommodate the picker which carries the filter tip or stub portion 6 and the length 1a of tobacco out of the chamber 4a into a guide tube 9 of any suitable continuous rod mechanism whereby a paper strip is wrapped around the alternating fillings to form a continuous cigarette rod which is subsequently cut off in the usual manner, the cutting mechanism being so timed that each cigarette contains

a charge of tobacco and a filter tip or stub portion.

In one embodiment of apparatus for carrying out the method according to the invention an intermittently rotatable drum 4 provided with a number of tubular bores 4a extending parallel with its axis, is arranged in front of the collector tube 2 of a machine, such as a tobacco-filling machine, adapted to discharge a continuous rod 1 of tobacco, the drum 4 being operated in conjunction with a rotary or other cutter 3 at its inlet end in such manner that when a suitable length 1a of tobacco rod 1 has entered one of the bores 4a of the drum 4 the feed of tobacco is momentarily checked while the drum 4 is moved to present the next bore 4a opposite the outlet from the said collector tube 2. An intermittently rotatable disc 7 is arranged to co-operate with the end of the drum 4 adjacent the collector tube 2 so that at one position bores 7a in the disc 7 come into alignment with the bores 4a in the drum 4. The disc 7 is adapted to receive filter tips or stub portions 6 inserted from suitable apparatus 19 by a plunger 19a during the period of rest of the disc 7 and of the drum 4. A reciprocating plunger 5 is operated to push a filter tip from one of the bores 7a in the disc 7 into the aligned bore 4a in the drum 4 and which contains a charge of tobacco. The plunger 5 preferably is provided with a longitudinal slot 5a in alignment with corresponding slots 7b, 4b respectively in the disc 7 and in the drum 4 so that pickers 8 may engage behind the tips 6 for the ejection of the same and of the charges of tobacco in front of the tips from the drum 4. The drum 4 and the disc 7 may be geared together by the provision of pins 7c on the disc 7 co-operating with slots 4c in the drum 4.

The picker mechanism may consist of two longitudinally reciprocable members 10 provided with vertical slides 10a carrying the picker members 8 and having pins 10b or rollers co-operating with cam tracks 11a in a member 11 disposed between side plates 12 provided with guides for the members 10, the cam tracks 11a being arranged so that in the forward movement the picker 8 descends into the aligned slots 4b, 7b referred to so as to engage behind a filter tip or stub portion 6 and when at or near the end of the drum 4 rises and returns to the initial position in such path that it is clear of the drum 4 and of the oppositely moving picker. To ensure the engagement of the respective pin 10b or roller with the upper portion of the cam track 11a on the return stroke, a pivoted member 10c is provided, such member 10c being normally held in the position shown in Figure 5 by means of a spring 10d so as to be capable of depression by the pin 10b or roller so as to allow such pin 10b or roller to pass from the lower portion of the cam track into the upper portion thereof. The pickers 8 are diverted outwardly at the upper part, as shown in Figure 4, so that the lower part of one picker may pass over the lower part of the other picker on the return stroke. As before described with reference to Figures 1, 2 and 3, the pickers carry the associated lengths into the guide tube 9 of cigarette rod-forming mechanism in which a paper strip 14 is wrapped around the continuous filling produced, the guide tube 9 being formed with a slot 9a (Figure 6) to accommodate the pickers. The members 10 may be reciprocated by means of cams (not shown) which may act thereon through double-armed levers 13 or equivalent mechanism and rods 13a. The operating cams preferably are so arranged

that at the end of the ejecting stroke the speed approximates to the speed of the continuous paper strip 14 which is wrapped around the filling and preferably also so that before the one picker disengages from the filter tip at the end of the stroke the other picker is commencing its forward and downward movement. In order to ensure accurate alignment of the bores or chambers 7a, 4a, a positioning pin 15 may be provided to engage in the lower pair of aligned bores before the plunger 5 passes into the upper pair of aligned bores. A stop 16 may be provided to prevent the tobacco rod from passing out of the drum 4 before its lateral movement out of alignment with the continuous tobacco rod.

If desired, the apparatus may be adapted, for instance as shown in Figure 7, so that a double length of the continuous tobacco rod is cut off and moved laterally as before described into alignment with a double length filter tip or stub portion disposed in a chamber 7a in the disc 7, such filter tip or stub portion being ejected from the disc 7 by a plunger 5 so as to abut against the length of tobacco, and the associated lengths being conveyed into the guide tube 9 by means of picker mechanism which, in such an arrangement, preferably comprises picker members 8 having parts 8a constituting links of an endless chain 17 carried over sprockets 18, 18a and driven in any suitable manner, a part of the chain 17 adjacent the outlet end of the drum 4 being guided over a sprocket 18b or pulley so that during the latter part of its forward stroke the picker is gradually withdrawn from the guide tube 9.

It will be understood that the intermittent movement of the drum 4 from one stage position to another is effected very rapidly and the insertion of the filter tip and the ejection of the composite charge of filter tip and tobacco from the drum 4 is so timed that in effect the charge of tobacco severed from the continuous tobacco rod moves forward at an increased speed substantially continuously in a path parallel with the continuous tobacco rod, the requisite forward speed of the composite filling being maintained by the action of the picker devices 8 so that the composite filling is continuous and is moving forward at the requisite speed for reception on the continuous paper wrapper 14 which is applied around the same in the manner usual in the manufacture of cigarettes on the continuous rod machine, the continuous rod produced being subsequently cut off in the usual manner by means of a cutting device operating in timed relation to the mechanism described to produce cigarettes in which filter tips are disposed at one end.

In a modification, the intermittently rotatable disc may be dispensed with and the filter tips may be inserted at the opposite end of the drum either at a position in alignment with the collector tube of the tobacco filling machine or at a preceding stage position. In such case the ejection of the composite charge of tobacco and filter tip from the drum may be effected by picker mechanism such as before described operating in the reverse direction so as to discharge the filling in a direction opposite to the travel of the tobacco rod emerging from the collector tube. Alternatively, the ejection may take place in the same direction as the travel of the tobacco rod by utilizing picker devices having circular or other engaging portions adapted to abut against the end of the tobacco charge.

It will be understood that the invention is not limited to the particular details of construction

hereinbefore described. For example, in place of drums or discs any other suitable form of intermittently movable carrier or carriers may be utilized, while the picker mechanism may be otherwise constructed and operated.

What I claim is:—

1. Apparatus for producing filter tip cigarettes on the continuous rod principle, comprising means for supplying a continuous tobacco rod, means for cutting successive lengths from the continuous tobacco rod, an intermittently movable carrier having chambers in which the lengths of tobacco are received and carried out of alignment with the continuous tobacco rod, means for inserting filter tips or like stub portions into the said chambers so as to abut the lengths of tobacco, means for supporting a continuous paper strip out of alignment with said tobacco rod, and means for removing the associated lengths of tobacco and filter tips or stub portions from the said chambers onto the continuous paper strip for the production of a continuous cigarette rod.

2. Apparatus for producing filter tip cigarettes on the continuous rod principle, comprising means for supplying a continuous tobacco rod, means for cutting successive lengths from said tobacco rod, an intermittently rotatable drum having parallel bores or chambers for the reception of the lengths of tobacco and for carrying the lengths out of alignment with the continuous tobacco rod, means for inserting filter tips or like stub portions into the said chambers so as to abut the lengths of tobacco, means for supporting a continuous paper strip out of alignment with said tobacco rod, and means for removing the associated lengths of tobacco and filter tips or stub portions from the said chambers onto the continuous paper strip for the production of a continuous cigarette rod.

3. Apparatus for producing filter tip cigarettes on the continuous rod principle, comprising means for supplying a continuous tobacco rod, means for cutting successive lengths from said tobacco rod, an intermittently rotatable drum having a plurality of spaced bores or chambers adjacent the periphery thereof extending parallel to the axis of the drum for the reception of the lengths of tobacco, an intermittently rotatable disc positioned with its axis parallel to the axis of the drum and having a plurality of bores extending therethrough parallel to the axis thereof, said drum and disc being so associated that a bore of the drum will register with a bore in the disc, means for supplying a filter tip or stub portion to the bores in the disc, means for supporting a continuous paper strip, and means for ejecting the length of tobacco and the filter tip from the registering bores of the drum and disc onto said paper strip.

4. Apparatus according to claim 1, in which the cutting means is arranged to cut off lengths of tobacco equal to twice the length of a cigarette, and including means for associating a double length filter tip with each length of tobacco.

5. Apparatus for producing filter tip cigarettes on the continuous rod principle, comprising means for supplying a continuous tobacco rod, means for cutting successive lengths from the continuous tobacco rod, an intermittently movable carrier having chambers in which the lengths of tobacco are received and carried out of alignment with the continuous tobacco rod, means for inserting filter tips or like stub portions into the said chambers so as to abut the lengths of tobacco, means for supporting a continuous paper strip out of alignment with said tobacco rod, and means for

removing the associated lengths of tobacco and filter tips or stub portions from the said chambers onto the continuous paper strip for the production of a continuous cigarette rod, said carrier having slots providing access to said bores, and said removing means comprising reciprocating picker mechanism adapted to extend through the slots in the carrier.

6. Apparatus for producing filter tip cigarettes on the continuous rod principle, comprising means for supplying a continuous tobacco rod, means for cutting successive lengths from said tobacco rod, an intermittently rotatable drum having parallel bores or chambers for the reception of the lengths of tobacco and for carrying the lengths out of alignment with the continuous tobacco rod, means for inserting filter tips or like stub portions into the said chambers so as to abut the lengths of tobacco, means for supporting a continuous paper strip out of alignment with said tobacco rod, and means for removing the associated lengths of tobacco and filter tips or stub portions from the said chambers onto the continuous paper strip for the production of a continuous cigarette rod, said drum having slots therein providing access to said bores, and said removing means comprising reciprocating picker mechanism adapted to extend through the slots in the drum.

7. Apparatus for producing filter tip cigarettes on the continuous rod principle, comprising means for supplying a continuous tobacco rod, means for cutting successive lengths from said tobacco rod, an intermittently rotatable drum having a plurality of spaced bores or chambers adjacent the periphery thereof extending parallel to the axis of the drum for the reception of the lengths of tobacco, an intermittently rotatable disc positioned with its axis parallel to the axis of the drum and having a plurality of bores extending therethrough parallel to the axis thereof, said drum and disc being so associated that a bore of the drum will register with a bore in the disc, means for supplying a filter tip or stub portion to the bores in the disc, means for supporting a continuous paper strip, and means for ejecting the length of tobacco and the filter tip from the registering bores of the drum and disc onto said paper strip, said drum and disc having slots therein providing access to said bores and adapted to register when the bores of the drum and disc are in register, and said ejecting means comprising reciprocating picker mechanism adapted to extend through the registering slots to engage the filter tip.

8. Apparatus for producing filter tip cigarettes on the continuous rod principle, comprising means for supplying a continuous tobacco rod, means for cutting successive lengths from the continuous tobacco rod, an intermittently movable carrier having chambers in which the lengths of tobacco are received and carried out of alignment with the continuous tobacco rod, means for inserting filter tips or like stub portions into the said chambers so as to abut the lengths of tobacco, means for supporting a continuous paper strip out of alignment with said tobacco rod, means for removing the associated lengths of tobacco and filter tips or stub portions from the said chambers onto the continuous paper strip for the production of a continuous cigarette rod, said carrier having slots providing access to said bores, and said removing means comprising picker mechanism adapted to extend through the slots in the carrier and an endless chain for moving said picker mechanism through said bores.

9. Apparatus for producing filter tip cigarettes on the continuous rod principle, comprising means for supplying a continuous tobacco rod, means for cutting successive lengths from said tobacco rod, an intermittently rotatable drum having parallel bores or chambers for the reception of the lengths of tobacco and for carrying the lengths out of alignment with the continuous tobacco rod, means for inserting filter tips or like stub portions into the said chambers so as to abut the lengths of tobacco, means for supporting a continuous paper strip out of alignment with said tobacco rod, means for removing the associated lengths of tobacco and filter tips or stub portions from the said chambers onto the continuous paper strip for the production of a continuous cigarette rod, said drum having slots therein providing access to said bores, and said removing means comprising picker mechanism adapted to extend through the slots in the drum and an endless chain for moving said picker mechanism through said bores.
10. Apparatus for producing filter tip cigarettes on the continuous rod principle, comprising means for supplying a continuous tobacco rod, means for cutting successive lengths from said tobacco rod, an intermittently rotatable drum having a plurality of spaced bores or chambers adjacent the periphery thereof extending parallel to the axis of the drum for the reception of the lengths of tobacco, an intermittently rotatable disc positioned with its axis parallel to the axis of the drum and having a plurality of bores extending therethrough parallel to the axis thereof, said drum and disc being so associated that a bore of the drum will register with a bore in the disc, means for supplying a filter tip or stub portion to the bores in the disc, means for supporting a continuous paper strip, means for ejecting the length of tobacco and the filter tip from the registering bores of the drum and disc onto said paper strip, said drum and disc having slots therein providing access to said bores and adapted to register when the bores of the drum and disc are in register, and said ejecting means comprising picker mechanism adapted to extend through the registering slots to engage the filter tip and an endless chain for moving said picker mechanism through said bores.
11. Apparatus for producing filter tip cigarettes on the continuous rod principle, comprising means for supplying a continuous tobacco rod, means for cutting successive lengths from the continuous tobacco rod, an intermittently movable carrier having chambers in which the lengths of tobacco are received and carried out of alignment with the continuous tobacco rod, means for inserting filter tips or like stub portions into the said chambers so as to abut the lengths of tobacco, means for supporting a continuous paper strip out of alignment with said tobacco rod, and means for removing the associated lengths of tobacco and filter tips or stub portions from the said chambers onto the continuous paper strip for the production of a continuous cigarette rod, said carrier having slots providing access to said bores, and said removing means comprising a plurality of picker devices, a carriage for each picker, means for reciprocating each carriage in a direction parallel to the bores in the carrier, and cam means for moving said picker devices laterally into and out of said slots during reciprocation of said carriages.
12. Apparatus for producing filter tip cigarettes on the continuous rod principle, comprising means for supplying a continuous tobacco rod, means for cutting successive lengths from said tobacco rod, an intermittently rotatable drum having parallel bores or chambers for the reception of the lengths of tobacco and for carrying the lengths out of alignment with the continuous tobacco rod, means for inserting filter tips or like stub portions into the said chambers so as to abut the lengths of tobacco, means for supporting a continuous paper strip out of alignment with said tobacco rod, and means for removing the associated lengths of tobacco and filter tips or stub portions from the said chambers onto the continuous paper strip for the production of a continuous cigarette rod, said drum having slots therein providing access to said bores, and said removing means comprising a plurality of picker devices, a carriage for each picker device, means for reciprocating each carriage in a direction parallel to the bores in the drum, and cam means for moving said picker devices laterally into and out of said slots during reciprocation of said carriages.
13. Apparatus for producing filter tip cigarettes on the continuous rod principle, comprising means for supplying a continuous tobacco rod, means for cutting successive lengths from said tobacco rod, an intermittently rotatable drum having a plurality of spaced bores or chambers adjacent the periphery thereof extending parallel to the axis of the drum for the reception of the lengths of tobacco, an intermittently rotatable disc positioned with its axis parallel to the axis of the drum and having a plurality of bores extending therethrough parallel to the axis thereof, said drum and disc being so associated that a bore of the drum will register with a bore in the disc, means for supplying a filter tip or stub portion to the bores in the disc, means for supporting a continuous paper strip, and means for ejecting the length of tobacco and the filter tip for the registering bores of the drum and disc onto said paper strip, said drum and disc having slots therein providing access to said bores and adapted to register when the bores of the drum and disc are in register, and said ejecting means comprising a plurality of picker devices, a carriage for each picker device, means for reciprocating each carriage in a direction parallel to the bores in the drum and disc, and cam means for moving said picker devices laterally into and out of said slots during reciprocation of said carriages.
14. In an apparatus of the class described, a carrier having a chamber for receiving a tobacco rod section, means for ejecting said rod section axially from said chamber comprising a pair of picker devices, a carriage for each picker device, means for slidably mounting the picker devices in said carriages, means for reciprocating said carriages in opposite directions, and cam means for shifting the picker devices into the chamber when moved in the ejecting direction and for shifting the devices out of the chamber when moved in the opposite direction.
15. In an apparatus of the class described, a carrier having a chamber for receiving a tobacco rod section, means for ejecting said rod section axially from said chamber comprising a pair of picker devices, a carriage for each picker device, means for slidably mounting the picker devices in said carriages, means for reciprocating said carriages in opposite directions, a plate positioned between said carriages longitudinally of the path

of travel thereof, said plate having upper and lower guide slots provided therein extending parallel to the chambers of the carrier, said plate also having curved slots joining the ends of said parallel slots, and guiding means on said picker devices extending into said slots for guiding the picker devices during the reciprocation thereof.

16. In an apparatus of the class described, a carrier having a chamber for receiving a tobacco rod section, means for ejecting said rod section axially from said chamber comprising a pair of picker devices, a carriage for each picker device, means for slidably mounting the picker devices in said carriages, means for reciprocating said carriages in opposite directions, a plate extending between said carriages longitudinally of the path of travel thereof, said plate having upper and lower guide slots provided therein extending parallel to the chambers of the carrier, said plate also having curved slots joining the ends of said parallel slots, guiding means on said picker devices extending into said slots for guiding the picker devices during the reciprocation thereof, and spring controlled means for shifting the guiding means from the lower to the upper slot when the terminal of the lower slot is reached.

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