May 28, 1935. W. F. M. EDWARDS ET AL 2,002,886

APPARATUS FOR THE PRODUCTION OF CIGARETTES

Filed Oct. 31, 1934 3 Sheets-Sheet 1

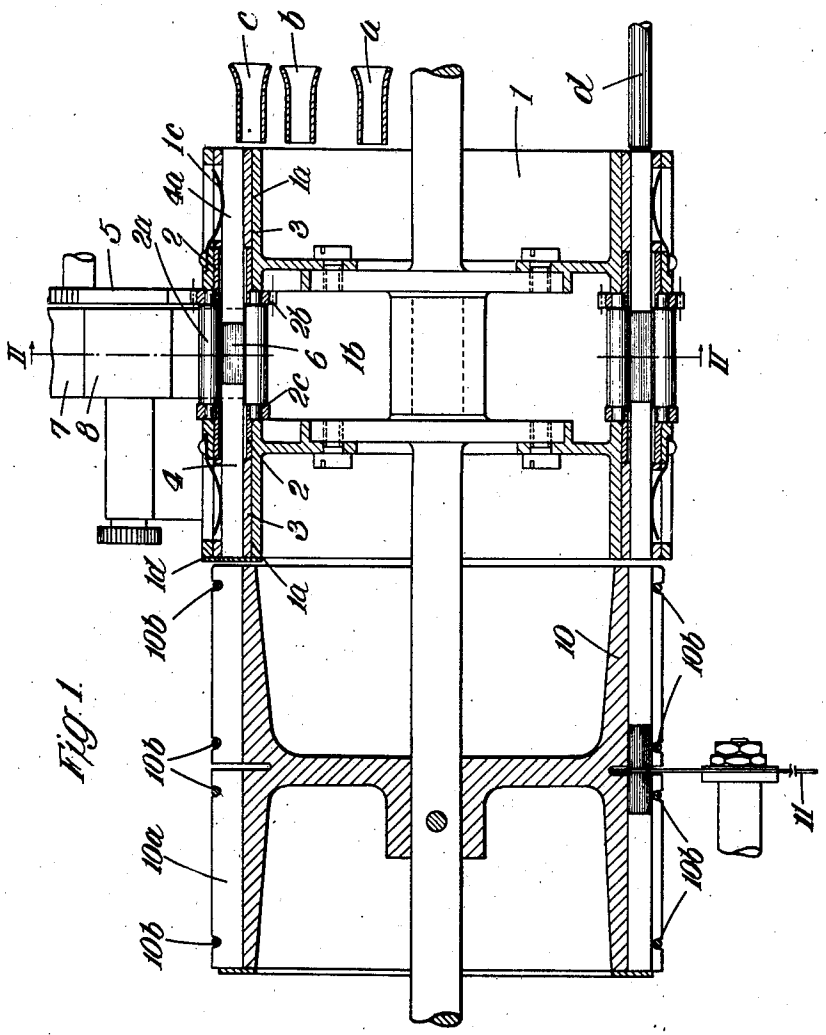

Fig. 1.

Inventors:
William F. M. Edwards
and Rowland Frank May
By
Attorney

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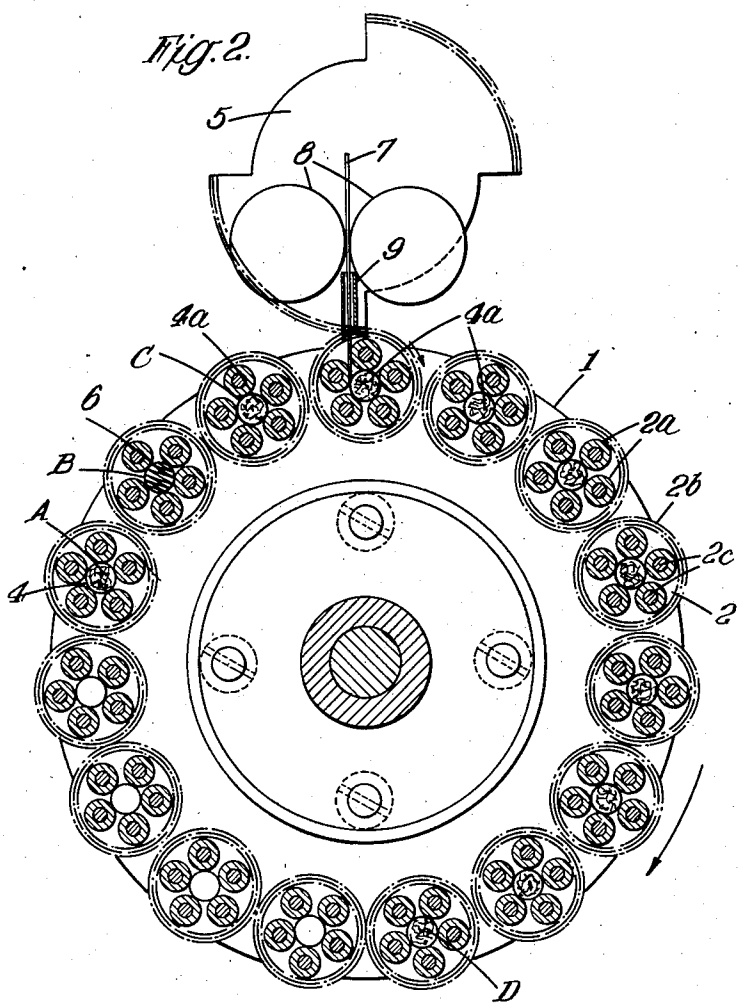
Fig. 2.



Inventors:
William F. M. Edwards
and Rowland Frank May
By Lee Townsend
Attorney.

May 28, 1935. W. F. M. EDWARDS ET AL 2,002,886

APPARATUS FOR THE PRODUCTION OF CIGARETTES

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Fig. 3.

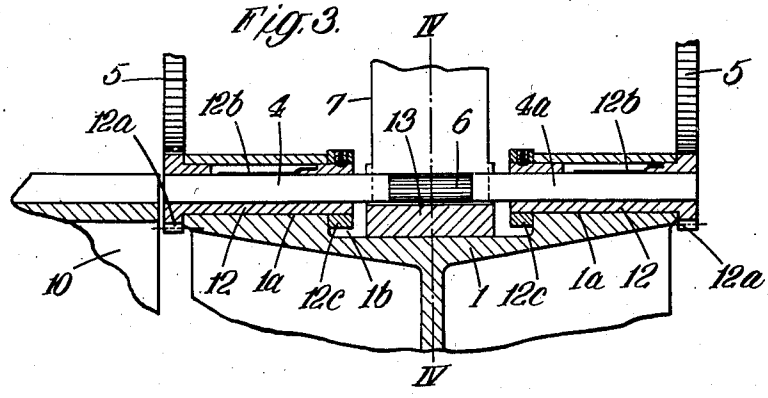


Fig. 4.

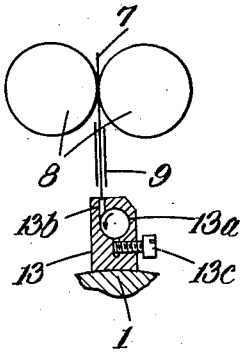


Fig. 6.

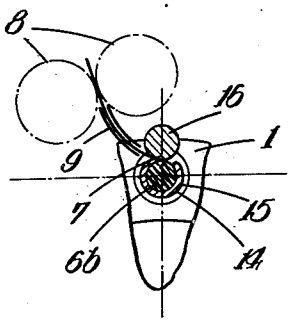
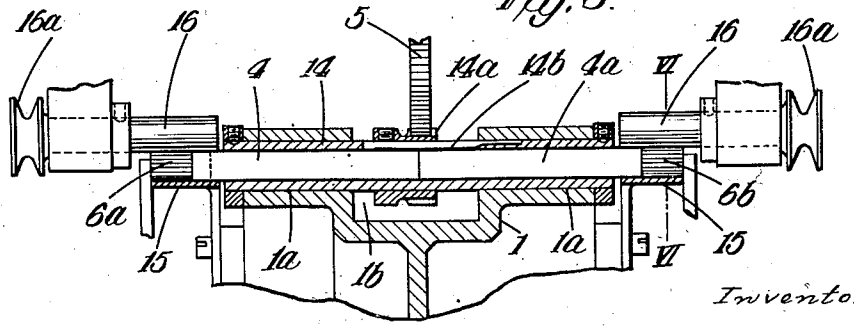


Fig. 5.



Inventors:
William F. M. Edwards
and Rowland Frank May
By Thurlow
Attorney.

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UNITED STATES PATENT OFFICE

2,002,886

APPARATUS FOR THE PRODUCTION OF CIGARETTES

William Frederick Maitland Edwards, London, and Rowland Frank May, Middlesex, England, assignors to Filter Tips Limited, London, England, a British company

Application October 31, 1934, Serial No. 750,904
In Great Britain July 14, 1933

7 Claims. (Cl. 131—39)

This invention relates to the production of cigarettes provided with filter tips or stub portions at the mouthpiece end, and has for its primary object to provide improved means for the production of such cigarettes by uniting cigarettes, which may be of shorter length than normal, with filter tips or stub portions by the application of encircling bands secured by adhesive.

According to the present invention, the improved apparatus comprises a drum or other suitable intermittently movable carrier having chambers, bores or the equivalent for the reception of the cigarettes and filter tips or stub portions to be united, and means operative while the drum or carrier is stationary to effect the wrapping of the uniting bands. The chambers or the like for the reception of the cigarettes may be non-rotatable in relation to the drum or carrier, in which case the application of the uniting bands is effected by relatively rotatable means. Alternatively, the chambers or the like for the reception of the cigarettes may be rotatable in relation to the drum or carrier so that the application of the uniting bands may be effected by rotation of the cigarettes during the periods when the drum or carrier is stationary.

The drum or carrier may be adapted to receive double length filter tips or stub portions at an intermediate position and cigarettes abutting opposite ends of said filter tips or stub portions, or may be adapted to receive double length cigarettes at an intermediate position and filter tips or stub portions abutting the opposite ends of such cigarettes. In a modification, the drum or carrier may be adapted to receive cigarettes from the opposite ends so that pairs of cigarettes abut one another and filter tips or stub portions abutting the outer ends of the pairs of cigarettes, or may be adapted to receive cigarettes and filter tips or stub portions respectively from opposite ends of the drum or carrier.

The wrapping of the uniting bands may be effected wholly or in part by the action of rollers or groups of rollers adapted to be revolved about the axes of the aligned cigarettes and filter tips or stub portions or by a slotted ferrule or equivalent rotating device. For instance, the rotatable wrapping means may comprise groups of rollers carried between pairs of rotatable members having central bores and non-rotatable chambers for the cigarettes associated with the said central bores so that the cigarettes are held with their ends projecting into the spaces enclosed by the groups of rollers, which spaces also accommodate the double length filter tips or stub portions.

When the chambers or the like for the reception of the cigarettes are rotatable in relation to the drum or carrier, the filter tips or stub portions and the adjacent parts of the cigarettes may be located in bores in non-rotatable members slotted for the entry of the uniting bands thereinto, the wrapping of the uniting bands being effected by the rotation of the cigarettes during the periods of non-rotation of the drum or carrier.

The rotation of the wrapping means during the periods when the drum or carrier is stationary may be effected by means such as a segmental driving gear.

When double length cigarettes have filter tips or stub portions united therewith or double length filter tips or stub portions are united to pairs of cigarettes as described, the united cigarettes and filter tips or stub portions may be delivered from the drum or carrier into a receiver in which they are held for bi-section by means of a suitable cutter, such receiver conveniently consisting of a drum or the like having receiving grooves or channels, and the three elements to be united by the encircling band or bands may be introduced successively into each chamber or the like in the drum or carrier from one end thereof and during successive periods of non-rotation of the said drum or carrier. Alternatively, the double length filter tip or stub portion or the double length cigarette may be first introduced into the chamber or the like in the drum or carrier and the two outer elements to be united therewith may be applied from opposite ends.

The cigarettes may be held in the chambers or the like in the drum or carrier by spring or other equivalent gripping means.

The apparatus may be adapted to receive cigarettes from a continuous rod cigarette-making machine so that the seam of the uniting band will be in alignment with or be in definite relation to the seam of the cigarette.

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

Figure 1 is a sectional plan view illustrating one embodiment of apparatus according to the invention;

Figure 2 is a section on the line II—II, Figure 1;

Figure 3 is a part longitudinal section illustrating a modification;

Figure 4 is a section on the line IV—IV, Figure 3;

Figure 5 is a part longitudinal section illustrating a further modification; and

Figure 6 is a section on the line VI—VI, Figure 5.

In carrying the invention into effect according to one embodiment and with reference to Figures 1 and 2 of the accompanying diagrammatic drawings, a carrier such as a drum 1 is provided, which drum is intermittently rotated step by step by any suitable driving mechanism and is constructed so as to provide a series of longitudinally extending bores 1a interrupted by a peripheral channel 1b at the intermediate portion of the drum 1. Flanged ferrules or like members 2 are rotatably mounted in the said bores 1a and are connected by pins 2c carrying rollers 2a. The outer portions of the bores 1a are provided with fixed sleeves 3 for the reception of cigarettes 4, 4a which may be gripped in the sleeves as by means of springs 1c. The central bores in the members 2 are slightly larger than the diameter of the cigarettes so that when rotated, as by the engagement of a segmental gear 5 with gear teeth 2b formed on the periphery of one of the members 2, there will be no twisting action on the cigarettes.

As shown more particularly in Figure 2, the cigarette 4 is fed in at the position A, the double length filter tip or stub portion 6 at the position B, and the cigarette 4a at the position C, the introduction being facilitated by the provision of flared inlet tubes a, b, c respectively (Figure 1). The position of the assembled cigarettes and double length filter tip or stub portion may be determined by means of a stop plate 1d.

A strip 7 of cork or other suitable material, which is cut off and pasted by any suitable means (not shown), is fed as by means of rollers 8 through a guide 9 so as to pass between two of the adjacent rollers 2a, as shown in Figure 2, into contact with the double length filter tip or stub portion 6 and the adjacent end portions of the cigarettes 4, 4a. On rotation of the respective members 2 by the segmental gear 5, the strip 7 will be wrapped, by the action of the rollers 2a, around the assembled cigarettes and double length filter tip or stub portion so as to unite the same together. After the wrapping operation the drum 1 is moved through one step for the application of a further strip of cork or the like to the next assembly of cigarettes and double length filter tip or stub portion. The united cigarettes and filter tips or stub portions are ejected, for instance, at the position D (Figure 2) by means of an ejecting plunger d (Figure 1) and may be inserted into a receiver in which they are held for bi-section. For example, such receiver may be constituted by a drum 10 mounted co-axially and moving with the drum 1, such drum 10 being provided with channels or grooves 10a in which the cigarettes are held, for instance, by wire or like members 10b. The bi-section is effected by means of a rotary or other cutter 11 and the cigarettes are finally discharged on to a suitable conveyor, the wire or like members 10b terminating at a suitable position for this purpose.

In a modification, as illustrated in Figures 3 and 4, the cigarettes 4, 4a are disposed in sleeves 12 rotatable in the bores 1a of the drum 1, the cigarettes being gripped therein as by the provision of springs 12b. The sleeves are provided at their outer ends with gears 12a and are retained at their inner ends by the provision of collars 12c. Intermediate the sleeves 12 a non-rotatable member 13 is provided having a bore 13a co-axial with the bores of the sleeves 12 and having a slot 13b through which a strip 7 of cork or the like is introduced into the bore 13a as by means of rollers 8 and a guide 9. A screw 13c may be provided for adjusting the diameter of the bore 13a.

The cigarettes 4, 4a and a double length filter tip or stub portion 6 are introduced, for example as before described, so that the filter tip or stub portion 6 is located in the bore 13a of the member 13 with the adjacent end portions of the cigarettes also extending into the bore 13a and abutting the filter tip or stub portion 6. While the drum 1 is stationary, a strip 7 of cork or the like is fed into position so as to contact with the assembled cigarettes and filter tip or stub portion and the sleeves 12 are rotated as by the provision of segmental gears 5 so as to cause the strip 7 to be wrapped around the assembled cigarettes and filter tip or stub portion. The united cigarettes and filter tips or stub portions may be ejected into a drum 10, as shown in Figure 1 for bi-section. If desired, the cigarettes may be fed into the sleeves 12 from opposite ends of the drum 1.

According to a further modification, as illustrated in Figures 5 and 6, a single sleeve extends through each pair of aligned bores 1a of the drum 1 and is rotatable therein as by the provision of a centrally disposed gear 14a co-operating with a segmental gear 5, the sleeve 14 preferably being slotted at an intermediate position to accommodate a spring 14b or other gripper for engaging the double length cigarette, or pair of cigarettes 4, 4a, inserted into the sleeve 14. The cigarettes held in the sleeves 14 project beyond the outer ends thereof into non-rotatable ferrules 15 which also accommodate the filter tips or stub portions 6a, 6b. At the wrapping position a roller 16 is mounted, such roller 16 being in contact with or in close proximity to the periphery of the assembled cigarette and filter tip or stub portion and being driven, for instance, by means of a pulley 16a. The ferrules 15 are cut away to accommodate the rollers 16 and to permit the step-by-step movement of the drum whereby successive ferrules 15 are brought into operative relation with the rollers 16. As shown in Figure 6 a strip 7 of cork or the like is fed as by means of rollers 8 and a guide 9 so as to enter between the roller 16 at each end of the drum and the respective filter tip or stub portion 6a or 6b so that on rotation of the cigarettes by the engagement of the gear 5 with the gear 14a, which occurs during the period of non-rotation of the drum 1, the wrapping of the strips 7 is effected. When double length cigarettes are employed, the product may be ejected into a receiver, such as the drum 10 shown in Figure 1, for bi-section. The apparatus shown in Figures 5 and 6 may be utilized for uniting single cigarettes with filter tips or stub portions, in which case the drum 1 is provided with only one series of bores 1a and the cigarettes and filter tips or stub portions are fed into the receiving chambers in the drum 1 from opposite ends thereof.

In all cases the apparatus may be arranged in conjunction with one or more continuous rod cigarette-making machines so that the cigarettes are fed into the drum so that their seams are in alignment with or in definite relation to the seams of the uniting bands.

In a further modification, the encircling band

for uniting the cigarette and filter tip or stub portion may be applied by rotation of the cigarette while the intermittently movable drum or carrier is at rest combined with the action of a rotatable ferrule or roller or rollers such as before described.

It will be understood that the invention is not limited to the particular details hereinbefore described. For example, in the construction in which the cigarettes are rotated for the application of the uniting band, they may be held in any suitable construction of rotatable carrier and, instead of an intermittently rotatable drum, an intermittently movable endless chain or other similar conveyor may be utilized. Furthermore, although the uniting band preferably consists of cork and is adapted to provide an external mouthpiece, the invention is applicable for the production of cigarettes with filter tips or stub portions at the mouthpiece ends thereof wherein the filter tips or stub portions are previously wrapped, in which case the uniting band may be comparatively narrow and may serve solely for joining the cigarettes and the filter tips or stub portions together.

What we claim is:—

1. An apparatus for the production of cigarettes provided with a stub portion at the mouthpiece end, comprising an intermittently movable carrier, means on the carrier for supporting a cigarette with an aligned stub portion, means for wrapping a uniting band about the aligned cigarette and stub portion, means for supplying the uniting band to the wrapping means, and means operable between the intermittent movements of the carrier for actuating the wrapping means.

2. An apparatus for the production of cigarettes provided with a stub portion at the mouthpiece end, comprising an intermittently movable carrier, means on the carrier for supporting a cigarette with an aligned stub portion in a stationary position, means adapted to rotate about the aligned cigarette and stub portion for wrapping a uniting band thereabout, means for supplying the uniting band to the wrapping means, and means operable between the intermittent movements of the carrier for actuating the wrapping means.

3. An apparatus for the production of cigarettes provided with a stub portion at the mouthpiece end, comprising an intermittently movable carrier, means on the carrier for supporting a cigarette with an aligned stub portion, means for supplying a uniting band to the cigarette and stub portion, and means operable between the intermittent movements of the carrier for rotating the supporting means to effect wrapping of the uniting band about the aligned cigarette and stub portion.

4. An apparatus for the production of cigarettes provided with a stub portion at the mouthpiece end, comprising an intermittently movable carrier, spaced means on the carrier for supporting a cigarette with an aligned stub portion, a group of planetary rollers associated with each supporting means and positioned about said cigarette at the end thereof abutting the stub portion for wrapping a uniting band about the cigarette and stub portion, a stationary device for feeding a uniting band strip to said rollers when moved into register therewith by said carrier, and means mounted on a stationary portion of the apparatus for rotating the planetary rollers about the axis of the cigarette between movements of the carrier and while the rollers are in register with the feeding device.

5. An apparatus for the production of cigarettes provided with a stub portion at the mouthpiece end, comprising an intermittently movable carrier, a supporting member on said carrier having a bore extending therethrough for supporting a stub portion and a cigarette to be united in alignment, said supporting member having a slot providing access to said bore, a device mounted on a stationary portion of the apparatus for feeding a strip of uniting band material into the slot of said supporting member when the carrier is in a position placing said slot in register with said feed device, means on said carrier for rotating said cigarette, and means mounted on the stationary portion of the apparatus operative between movements of said carrier for actuating the cigarette rotating means when the slot of the member supporting the cigarette is in a position to receive the banding strip.

6. An apparatus for the production of cigarettes provided with a stub portion at the mouthpiece end, comprising an intermittently movable carrier, a supporting member on said carrier having a bore extending therethrough for supporting a stub portion and a cigarette to be united in alignment, said supporting member having a slot providing access to said bore, a device mounted on a stationary portion of the apparatus for feeding a strip of uniting band material into the slot of said supporting member when the carrier is in a position placing said slot in register with said feed device, means on said carrier for rotating said cigarettes, and a segment gear mounted on the stationary portion of the apparatus operative between movements of said carrier for actuating the cigarette rotating means when the slot of the member supporting the cigarette is in a position to receive the banding strip.

7. An apparatus for the production of cigarettes provided with a stub portion at the mouthpiece end, comprising an intermittently movable carrier, means on the carrier for supporting a cigarette, a pair of spaced annular members rotatably mounted in alignment with said supporting means, a plurality of rollers positioned between said annular members with their axes parallel to the axis of said members and spaced thereabout to define a chamber in alignment with said supporting means, said chamber being adapted to surround one end of the cigarette and support a stub portion in alignment therewith, a uniting band strip feeding device mounted on a stationary portion of the apparatus for feeding a strip of banding material to the stub portion and cigarette surrounded by said rollers when brought into registering position by the carrier, and means on the stationary portion of the apparatus for rotating said annular members and rollers between intermittent movements of said carrier to wrap the band about the cigarette and stub portion.

WILLIAM FREDERICK MAITLAND EDWARDS.
ROWLAND FRANK MAY.