

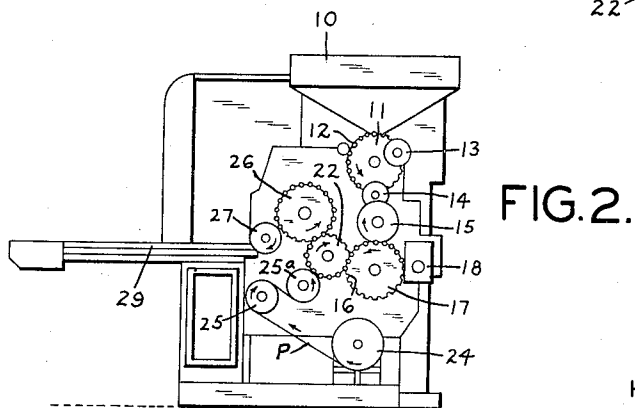
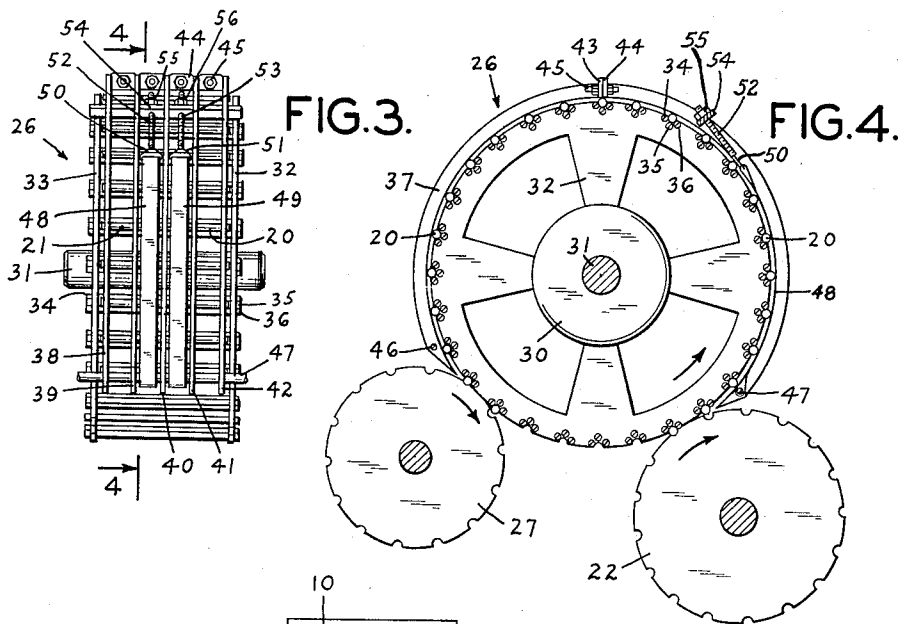
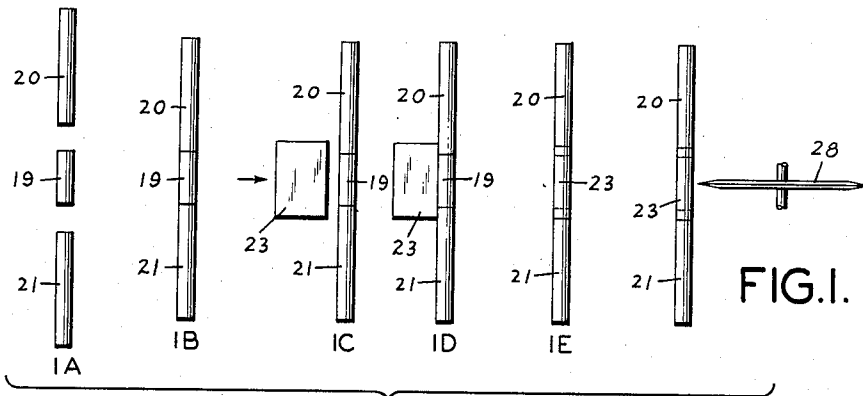
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APPARATUS FOR APPLYING FILTER TIPS TO CIGARETTES

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## APPARATUS FOR APPLYING FILTER TIPS TO CIGARETTES

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This invention relates to the manufacture of cigarettes and, more particularly, to apparatus for attaching filter tips to cigarettes.

Apparatus is currently used in the manufacture of cigarettes which supplies filter tip material in lengths equal to a plurality of filter tips, for example, six filter tips. The lengths of filter tip material are cut into shorter lengths equal in length to two filter tips and the shorter lengths of filter tip material are assembled between and in alignment with two cigarettes which are cut from a continuously formed cigarette rod. A short strip of gummed or adhesive coated tipping paper is adhered to the filter tip and the adjacent ends of the cigarettes and this assembly is introduced into a wrapping drum. Hinged plates or fingers on the wrapping drum fold the strip of tipping paper around the double filter tip and the adjacent ends of the cigarettes to form a double cigarette and filter unit which is cut through the middle of the filter to form two separate filter tip cigarettes.

The drum for folding or wrapping the tipping paper around the filter member and the cigarette includes cams, springs and the like for operating the folding fingers or plates and is difficult to adjust and maintain in proper operating condition. Even when the wrapping device is adjusted accurately, a good union or adhesion is not always obtained between the overlapped ends of the strips of tipping paper with the result that imperfect cigarettes frequently are made.

In accordance with the present invention, a new and simplified wrapping device is provided which is interchangeable with the wrapping drum of prior machines and which wraps the tipping paper with consistent uniformity and precision around the tip and the adjacent cigarettes and at the same time shaping the cigarettes to a uniform cylindrical form.

More particularly, in accordance with the present invention, the new wrapping device includes a drum which is provided with a plurality of groups of freely rotatable rollers, each group forming a pocket for receiving a double length filter, adjacent cigarettes and a strip of tipping paper adhered thereto and friction means disposed around the periphery of the drum which engages the cigarettes and the filter and rolls them around their axis as a unit thereby wrapping the tipping paper around the cigarettes and interposed double length tip. During the rolling operation, the ends of the tipping paper are overlapped and pressed together and further the rolling operation tends to eliminate any irregularities in the cross-section of the filter and cigarettes thereby producing uniformly cylindrical cigarettes. After wrapping, the filter is severed at its middle to form two cigarettes each having a filter tip attached thereto.

The new wrapping device requires no adjustment of any means for wrapping the tipping paper around the filter-cigarette assembly. The movement of the drum relative to the friction members, for example, flexible belts, is sufficient to cause rolling of the cigarettes and filter and wrapping of the tipping paper around them. The new wrapping device need only be timed to receive cigarette-filter units in the roller pockets thereof and such timing can be obtained by driving the wrapping drum by means of appropriate gearing or the like.

For a better understanding of the present invention

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reference may be had to the accompanying drawings in which:

FIGURE 1 is a schematic illustration of the steps of assembling cigarettes and a filter tip plug and wrapping the plug and cigarettes and separating the unit produced thereby into two cigarettes;

FIGURE 2 is a schematic side elevational view of a typical machine for attaching filter tips to cigarettes including a filter tip wrapping device of the type embodying the present invention;

FIGURE 3 is a front elevational view of the new form of wrapping device embodying the present invention; and

FIGURE 4 is a view in section taken on line 4-4 of FIGURE 3.

The present invention will be described in relation to a commercially available machine for applying filter tips to cigarettes. Referring to FIGURE 2, filter tip rods of a length equal to, for example, six filter tips, are supplied from a hopper 10 to a feed roll 11 provided with grooves 12 extending lengthwise thereof adapted to receive the lengths of the filter tip material. The filter rods are moved past gang rotating cutters 13 which cut the lengths into three sections each equal in length to two filter tips and discharges the cut sections into a transfer roller 14 also provided with lengthwise grooves. From the transfer roller 14, the filter sections are transferred to a separating and aligning drum 15 where the axially aligned sections are moved first into an echeloned relation and then shifted into a row in which the several filter sections are supplied one by one to about the middles of the peripheral grooves 16 of an assembly drum 17. Pairs of cigarettes are also introduced into each groove 16 from a cigarette feeding device 18 so that as shown at 1A of FIGURE 1, the double filter plug 19 is disposed between two cigarettes 20 and 21.

By means of suitable plungers, the cigarettes 20 and 21 are pushed endwise into engagement with the filter 19 as shown at 1B of FIGURE 1. The assembly is then discharged into the grooves in a transfer drum 22 where a strip 23 of tipping paper is adhered thereto. The tipping paper P is supplied from a roll 24 and passes around feed rollers 25 and 25a and over a gumming roller (not shown) where adhesive is applied to one side of the strip. A cutter (not shown) cuts tipping strips 23 from the leading end of the long strip of paper P as shown at 1C and each tipping strip 23 is pressed against a filter 19 and the adjacent ends of the cigarettes 20 and 21 as shown at 1D in FIGURE 1. The assembly thus formed is transferred by the drum 22 to the wrapping device 26 embodying the present invention and, after wrapping of the tipping paper around the filter 19 and the ends of the cigarettes 20 and 21 a unit like that shown in 1E is formed and is transferred to the discharge roller 27 having a cutting knife 28 thereon which cuts the filter apart at its middle and thereby forming two separate filter tip cigarettes which are discharged onto the conveyor 29 for packaging.

Referring now to FIGS. 3 and 4, a wrapping device 26 according to the present invention includes a hub 30 mounted on a shaft 31 which is driven in timed relation to the rollers 22 and 27 of the machine. Fixed to the hub are end plates 32 and 33 of disc-like form. Extending between the end plates 32 and 33 and rotatably mounted therein are a plurality of groups of rods, each group having for example, three rods or rollers 34, 35 and 36, and each group forming a pocket for receiving a filter 19 and two cigarettes 20 and 21 having the wrapping strip 23 adhered at one end thereto as shown at 1D of FIG. 1. The hub, end plates and rods or rollers, form a drum-like member referred to hereinafter as a drum. The arrangement of the groups of rollers around the periphery of the end plates 32 and 33 is such that successive cigarette and

filter units (1D of FIG. 1) carried in the grooves of the drum 22 will be received in the successive pockets formed by the groups of rollers. As shown in FIG. 4, the drum of the wrapping device 26 rotates in a counterclockwise direction. In order to retain the cigarettes in the pockets formed by the groups of rollers 34 to 36, a cage 37 is provided which is made up of arcuate bars 38, 39, 40, 41 and 42 which extend around the major portion of the periphery of the drum. To facilitate assembly of the cage 37, the bars are divided at their mid-portions and welded to cross bars 43 and 44 which are connected by means of bolts 45. Further, to maintain the bars in spaced relation, other suitable transverse members 46 may be provided.

In order to roll the strip 23 around the cigarettes 20 and 21 and the filter 19, friction means such as for example, the flexible belts 48 and 49 are disposed around a portion of the periphery of the drum and between the cage bars 39, 40 and 41. The belts are attached at their lower ends to the removable cross pin 47 mounted in the bars 39, 40 and 41. Loops 50 and 51 formed of wire or the like engage the upper ends of the belts 48 and 49 and are secured to screw threaded adjusting members 52 and 53 extending through cross bar 54 fixed to the arcuate bars 38 to 42. Adjusting nuts 55 and 56 are provided to adjust the belts so that they lightly engage the inner ends of the cigarettes, the filter 19 and the wrapping strip 23 in the opposing pockets and cause them to rotate as the drum turns in a counterclockwise direction. The freely rotatable rollers 34 to 36 permit free rotation of the cigarette-filter unit. In this way, the filter tipping strip 23 is rolled around and its gummed or adhesive coated surface is adhered to the filter 19 and to the adjacent ends of the cigarettes 20 and 21 and the ends of the strip 23 are overlapped and pressed firmly together. Moreover, the rotation of the cigarettes while supported by the rollers 34, 35 and 36 removes any irregularities in the cross section of the cigarettes or filter and produces neatly formed cylindrical products. The cigarette and filter units shown at 1E of FIG. 1 are carried around to the discharge roller 27 and the cutter 28 where each unit is divided at its center line to form two cigarettes, as described above.

With the wrapping device 26 described, it will be apparent that the only timing required for proper wrapping and attachment of filters to the cigarette is the timing of rotation of the drum of the wrapping device 26 with respect to the supply roller 22 and the discharge roller 27. This can be accomplished by suitable gearing or the like and once the proper timing has been established, no further adjustment is required except for occasional adjustment of the belts 48 and 49 to assure that they maintain the proper contact with the filter-cigarette assembly to cause them to rotate without substantial slippage.

It will be understood that the wrapping device of the present invention is susceptible to changes in dimensions and in the structure and arrangement of the parts and it may be used in other types of machines than the tip attaching machine described herein.

Accordingly, the form of invention disclosed herein should be considered as illustrative and not as limiting and that variations thereof fall within the scope of the invention as defined in the following claims.

We claim:

1. In apparatus for attaching filter tips to cigarettes having means for assembling a pair of cigarettes and a filter plug in axial alignment, said filter plug being interposed between said cigarettes and adhering an end of a strip of tipping paper to said plug and the ends of said cigarettes adjacent to said plug; a device for wrapping said strip around said plug and said ends of said cigarettes, comprising an endless movable member having a plurality of groups of substantially parallel rollers disposed around its periphery, means on said movable member supporting said rollers of each group for substantially free relative rotation and in closely spaced relation to form a pocket for receiving and directly engaging a pair of aligned cigarettes and an interposed filter plug, relatively fixed, flexible friction means engageable with said cigarettes and plug and means for moving said member relative to said friction means to rotate said cigarettes and plug and roll said strip around them.

2. The wrapping device set forth in claim 1 in which said endless member comprises a drum and said friction means comprises at least one flexible belt adjacent and extending partially around said drum.

3. The wrapping device set forth in claim 2 comprising a fixed frame having at least two spaced apart bars extending around a portion of said drum for retaining said cigarettes and plugs in said pockets during rotation of said drum and means on said frame for supporting said flexible belt between said bars and free of engagement therewith.

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