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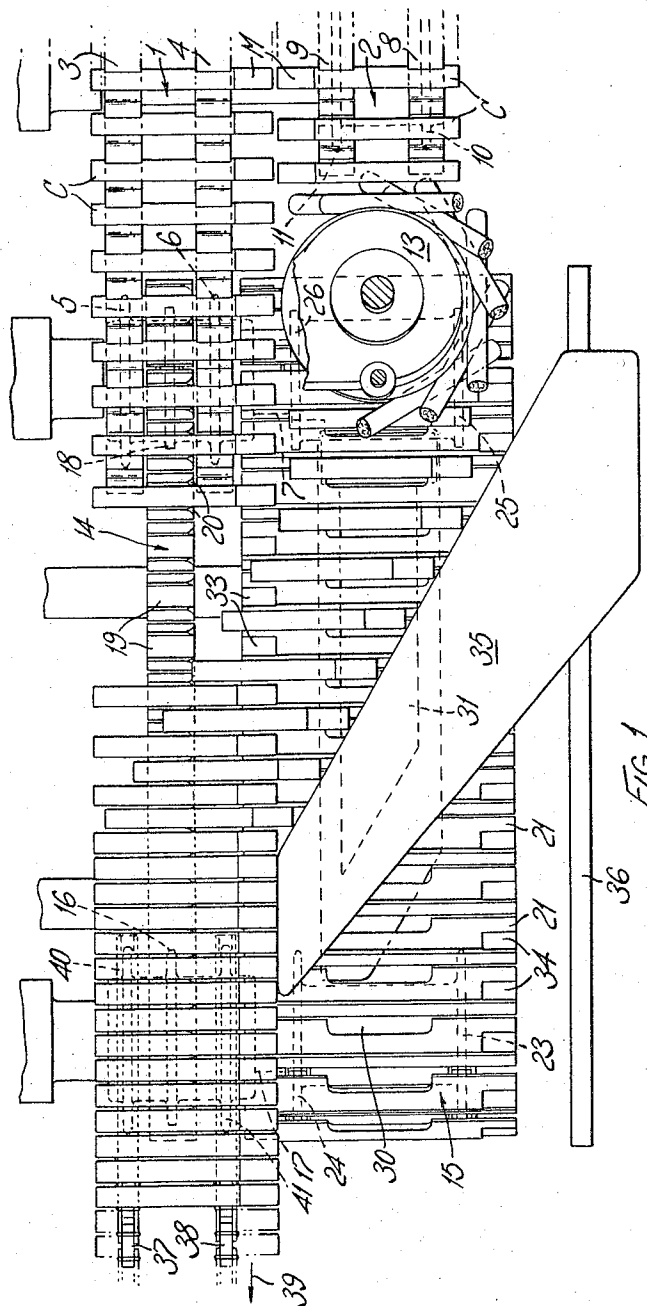
T. ROWLANDS

3,306,423

COLLECTING AND ARRANGING CIGARETTES

Filed March 14, 1966

2 Sheets-Sheet 1



Inventor  
Tom Rowlands

Watson, Cole, Grindle & Watson  
Attorneys

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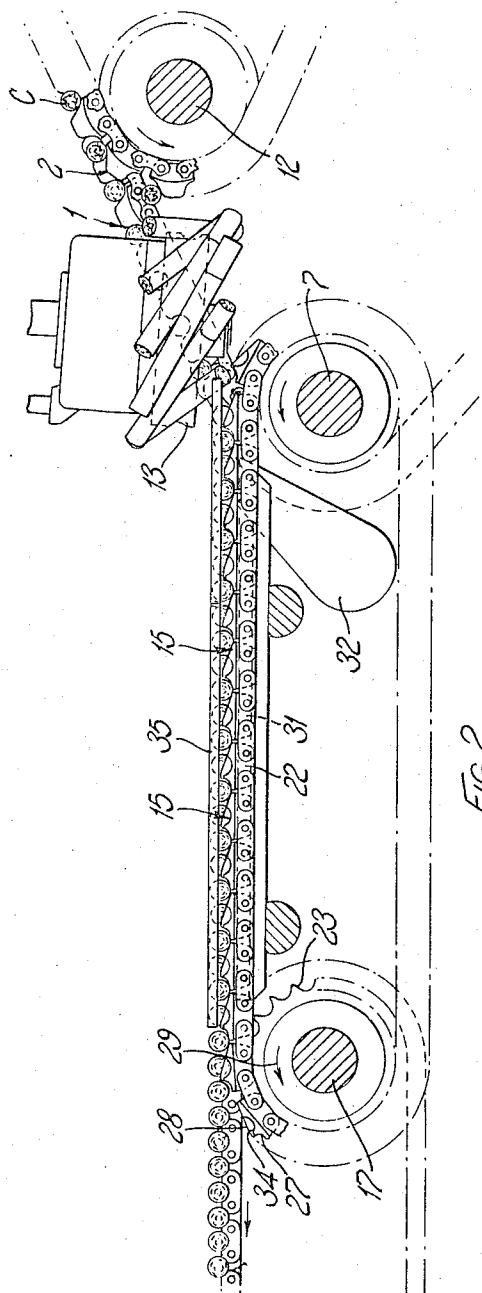


FIG. 2.

Inventor:  
Tom Rowlands

Watson, Cole, Grindle & Watson  
Attorneys

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**COLLECTING AND ARRANGING CIGARETTES**  
Tom Rowlands, London, England, assignor to Molins  
Machine Company Limited, London, England, a cor-  
poration of Great Britain

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11,750/65

5 Claims. (Cl. 198—32)

This invention concerns improvements relating to apparatus for collecting or arranging cigarettes and, in particular, to arranging cigarettes in a single row as they issue from a continuous rod cigarette-making machine.

When cigarettes are being conveyed sideways, for example on the catcher band of a continuous rod cigarette-making machine, it is frequently desired to rearrange them into a single row. For cigarettes provided with tips or mouthpiece portions or the like, it is usual to use during their manufacture a double mouthpiece portion which is united to single cigarette portions on either side and then to cut through the double length mouthpiece portion to produce two single mouthpiece cigarettes. These cigarettes are then usually conveyed sideways in two rows with normally the mouthpiece ends of the cigarettes in one row all pointing in one direction while those of the cigarettes in the other row point in the opposite direction. For convenience in collecting, or for any other reason such as ease of inspection, it is usually desirable to have all the cigarettes in a single row with their mouthpieces all pointing in the same direction. It is known how to change the orientation of one of two rows of mouthpiece cigarettes; for example, apparatus for this purpose is disclosed in my United States Patent No. 3,000,488, issued September 19, 1961. Furthermore ways have been proposed for forming two rows into one.

It is an object of the present invention to provide simplified apparatus by which the cigarettes issuing in two rows from the catcher of a cigarette-making machine may be formed into one row.

According to the present invention there is provided apparatus for forming two side by side rows of cigarettes moving in a direction transversely of their axes into one row, comprising a first fluted conveying surface, a second fluted conveying surface disposed alongside the first and having its flutes spaced at double the pitch of those of the first surface, feeding means adapted to supply to the two surfaces two rows of cigarettes in which each cigarette is separated from each adjacent cigarette in its own row by a distance equal to the pitch of the second conveyor's flutes and is aligned with a gap between adjoining cigarettes of the other row, and ploughing means by which cigarettes are moved axially from the second surface into empty flutes on the first surface.

Each space between flutes of the second surface may comprise a sloped ramp arranged so that a cigarette falling thereon will roll into the next following flute.

Apparatus for arranging cigarettes in a single row in accordance with the invention will now be described by way of example with reference to the accompanying drawings in which:

FIGURE 1 is a plan of apparatus for converting two rows of cigarettes into one row.

FIGURE 2 is a side elevation of FIGURE 1.

Referring to FIGURES 1 and 2, cigarettes C having mouthpiece portions M are shown as moving in two side by side rows on conveyors 1 and 2, the cigarettes being in side to side formation. The conveyor 1 comprises two identical chains 3 and 4 driven by sprockets 5 and 6 respectively which are keyed to drive shaft 7. The conveyor 2 comprises two identical chains 8 and 9 driven respec-

tively by sprockets 10 and 11 keyed to drive shaft 12 (FIG. 2).

The conveyors 1 and 2 are supplied with mouthpiece cigarettes which have been produced by bisecting assemblies consisting of a double-length mouthpiece portion flanked by two single-length cigarette portions, the whole being joined by a uniting band. It will be seen that the newly cut cigarettes are at this stage in two side by side rows with the mouthpiece end of the cigarettes of one row pointing towards those of the cigarettes in the other row. Before the cigarettes of the two rows can be rearranged into a single row it is necessary to turn all the cigarettes of one row so that all the mouthpiece portions, i.e. of both rows, point in the same direction. This is effected by reversing apparatus as disclosed in my United States Patent No. 3,000,488, consisting essentially of a rotatable suction chamber 13 to which cigarettes discharged by the conveyor 2 adhere.

The suction chamber 13 and the chains 3 and 4 as they pass around the sprockets 5 and 6 constitute feed means to deliver onto first and second fluted conveying surfaces 14 and 15 respectively two side by side rows of cigarettes. The conveying surface 14, in this case a chain conveyor, is driven by sprocket 16 keyed to shaft 17, with the chain returning about a disc 18 on the shaft 7. The conveying surface, or chain 14 comprises adjacent flutes formed by the links of the chain. Plain flutes 19 alternate with flutes 20 having relieved entries on the side facing the conveying surface 15. The conveying surface 15 comprises links 21 fixed to the links of two chains one of which 22 can be seen in FIGURE 2. These two chains are driven by sprockets 23 and 24 keyed to the shaft 17 and return around discs 25 and 26 fixed to the shaft 7.

Each of the links 21 is as wide as a pair of flutes 19 and 20 on the conveying surface 14. As can be seen in FIGURE 2 each link 21 comprises a concave surface 27 merging into a sloped ramp 28 and the sloped ramp 28 of one link forms a flute with the concave surface 27 of the next following link, the movement of the conveying surface being in the direction indicated by arrow 29. In the side of each ramp 28 is an elongated slot 30 which for part of the run of the conveying surface 15 is in communication with a suction chamber 31. The chamber 31 in its turn communicates with a suction source which is not shown via ducting 32. At the ends of each link 21 are short subsidiary flutes 33 and 34.

A plough 35 fixed to a rail 36 lies across the path of the conveying surface 15.

Two further chain link conveyors 37 and 38 moving in the direction of the arrow 39 are driven by sprockets which are not shown and return about discs 40 and 41 fixed to the shaft 17.

The operation of the apparatus is as follows. One row of cigarettes is carried by the conveyor 1 which is in timed relationship with the conveying surface 14 so that the cigarettes discharged therefrom only enter the plain flutes 19 of the conveying surface 14. Since the chains of the conveyor 1 and of the conveying surface 14 both pass around the sprockets 5 and 6 and the disc 18 carried on the shaft 7 the transfer of the cigarettes is perfectly smooth.

The other row of cigarettes carried by the conveyor 2 have their orientation changed so that their mouthpiece portions point in the same direction as those of the cigarettes carried by the conveyor 1, this change being achieved in known fashion by the suction chamber 13. From the suction chamber 13 they fall onto the conveying surface 15 which consists of alternating ramps 28 and concave surfaces 27. On such a surface the cigarettes can only come to rest in the flutes formed by the bottom of one ramp and the next following concave surface.

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The cigarettes are held more or less firmly in their flutes by the action of suction through the slots 30. These so-called flutes are in line with the flutes 20 which have relieved entries on the conveying surface 14. Thus as the cigarettes on the conveying surface 15 move to the left as seen when looking at both figures the plough 35 engages their mouthpiece end and causes them to slide in their flutes until they enter the empty relieved entry flutes 20 of the conveying surface 14. If for any reason a cigarette should occupy one of the flutes 20 it will merely be pushed out by the appropriate cigarette as it enters that flute under the action of the plough 35.

Since the conveying surface 14 is only a single chain with narrow links it is necessary to provide subsidiary support for all cigarettes conveyed thereby. This support is effected by the short flutes 33 in the ends of the links 21 of the conveying surface 15. The plough extends in the direction of the conveying surface 14 only so far so these short flutes 33 so that cigarettes transferred from the conveying surface 15 remain with their mouthpiece ends supported by the flutes 33. Similar flutes 34 are provided since the conveying surfaces 15 and 14 can be interchanged with the transfer of one row of cigarettes being carried off in the opposite direction.

At the end of the conveying surface 14 the single row of cigarettes is smoothly transferred to the two link chain conveyors 37 and 38.

What I claim as my invention and desire to secure by Letters Patent is:

1. Apparatus for forming two side by side rows of cigarettes moving in a direction transversely of their axes into one row, comprising a first fluted conveying surface, a second fluted conveying surface disposed alongside the first and having its flutes spaced at double the pitch of those of the first surface, means to drive said surfaces at

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the same speeds, feeding means adapted to supply to the two surfaces two rows of cigarettes in which each cigarette in which each cigarette is separated from each adjacent cigarette in its own row by a distance equal to the pitch of the second conveyor's flutes and is aligned with a gap between adjoining cigarettes of the other row, and ploughing means by which cigarettes are moved axially from the second surface into empty flutes on the first surface.

2. Apparatus as claimed in claim 1 wherein each space between adjoining flutes of the second surface comprises a sloped ramp arranged so that a cigarette falling thereon will roll into the next following flute.

3. Apparatus as claimed in claim 1 wherein the two conveying surfaces are chain conveyors.

4. Apparatus as claimed in claim 2 in which the first conveying surface comprises a single chain with flutes formed by links of said chain, plain flutes alternating with flutes having relieved entries on the side facing the second conveying surface, which latter comprises two chains to which are fixed links each formed to provide a concave surface merging into one of the sloped ramps, the arrangement being such that the ramp of one link forms a flute with the concave surface of the next following link.

5. Apparatus as claimed in claim 1, including means for applying suction to the flutes of the second surface to hold cigarettes therein.

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EVON C. BLUNK, *Primary Examiner*.

R. E. AEGERTER, *Assistant Examiner*.