

12 **EUROPEAN PATENT APPLICATION**

21 Application number: 81305814.6

51 Int. Cl.³: A 24 C 5/52

22 Date of filing: 09.12.81

43 Date of publication of application:
15.06.83 Bulletin 83/24

64 Designated Contracting States:
DE IT

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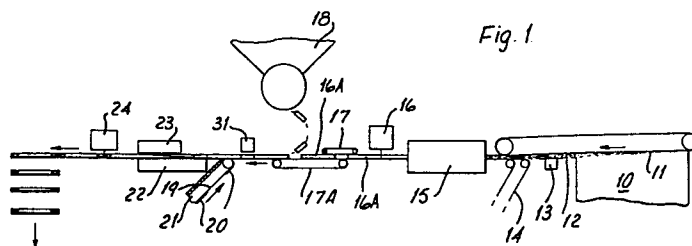
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64 Cigarette manufacture.

57 This invention is concerned with the manufacture of double cigarette units each consisting of a double-length tobacco rod having filters secured to its opposite ends. Cutting in half of such double cigarettes units to form separate filter cigarettes may be delayed until just prior to packing of the cigarettes, until which time the filters at the ends of the double cigarette units seal in the tobacco. The

manufacture of double cigarette units according to this invention is an in-line process in which double tobacco rods (16A) and intervening double filters (18A) are joined by portions of tipping paper (20) while moving axially so as to form a continuous rod which is then cut through the middle of the double filters to produce the specified double cigarette units (24A).



Cigarette Manufacture

This invention is concerned with the manufacture of double-tipped cigarette units, each comprising a double-length tobacco rod to each end of which a filter portion is secured; such units will, for convenience be referred to as "double cigarette units". In accordance with the invention described in our British patent specification No. 1584551 (and corresponding German Offenlegungsschrift 2716391), such cigarette units may be conveyed to a packing machine at which the units are cut through the middle to form individual filter-tipped cigarettes. In that way, the tobacco is positively retained until just prior to packing of the cigarettes.

According to the present invention, such double-length cigarette units are made by forming a continuous tobacco-filled rod (in any known manner), cutting the rod at regular intervals to form double-length tobacco rods, spacing the tobacco rods apart while they are moving longitudinally, inserting double-length filter portions between successive rods, applying strips of uniting material at regular intervals so that each strip extends along the entire length of a double-filter portion and overlap the adjacent ends of the adjacent tobacco rods, wrapping the strips around the tobacco and filter portions to form a continuous rod comprising alternate double tobacco and filter portions, and then cutting the continuous rod through the middle of each double-filter portion to form the desired double-cigarette units.

The invention avoids the production of "ring-tipped" cigarettes, as described in the above-mentioned Patent Application. In other words, this invention enables conventional filter-tipped cigarettes to be made, with the
5 "cork" or other uniting web surrounding the entire filter portion instead of only the end adjacent the tobacco rod.

The term "tobacco" in this content is intended to include any smokable material or mixture of such materials, including possibly reconstituted tobacco or
10 synthetic tobacco or both.

Example of machines according to this invention are shown in the accompanying diagrammatic drawings. In these drawings:

Figure 1 is a diagrammatic overall view of one
15 machine, and

Figure 2 shows a modification of part of the machine shown in Figure 1.

Figure 1 shows a basic cigarette making machine comprising a chimney 10 up which tobacco is showered, by
20 means of an upward-moving air stream, onto a suction band 11 to form a continuous cigarette filler stream 12. The filler stream is trimmed by a trimming device 13 and is then deposited on a continuous wrapper web 14 which is wrapped around the filler stream in a rod-forming section
25 15 to form a continuous cigarette rod. Further details of the machine may be similar to the Molins Mark 8 or Mark 9 cigarette making machine, though other completely different forms of machine may be used for this purpose.

The continuous cigarette rod is cut at regular intervals by a cutting device 16 to form double-length tobacco rods 16A. These rods are then spaced apart, for example by means of a faster moving suction band 17, to produce gaps between which double-length filter portions 18A are fed by a device 18. This device 18 may be as described in our British Patent Specification No. 1471534 (and corresponding German Offenlegungsschrift 2434449).

The stream of alternate cigarette and filter rods is then conveyed forward by a band 17A and is closed up so as to eliminate the gaps between successive rods. The stream of rods is then fed onto an air-pervious tape 19 which carries on its outer surface spaced web portions 20 with the aid of suction applied through the tape 19 from a suction chamber 21. Each web portion 20 is applied over one double-filter rod and overlaps onto the ends of the adjacent tobacco rods. The web 19 moves along a bed member 22 which progressively bends the tape 19 and consequently also the web portion 20 into a U-section, after which the upper edges of the web portions 20 are bent further around the rod by a device 23 so as to be wrapped completely around the rods. The composite rod which is thus formed is then cut at regular intervals by a cutting device 24 to form double-cigarette units 24A of the construction already described. These cigarette units are then conveyed to a packing machine at which they are cut through the middle to form individual filter-tipped cigarettes.

The device 23 which completes the wrapping of the web portions 20 around the rods may, for example, comprise a pair of rotary tucker members each having one or more web-engaging parts which fold over the edges of successive webs when the webs are aligned with the device 22. Alternatively it may be possible to fold over the edges of the web portions by means of stationary folding members.

Other known means of spacing apart the tobacco rods may be used. Such means were used in early designs of our filter attachment machines, for example as described in British patent specification No. 871,517.

Figure 2 shows a modified arrangement for feeding strips of uniting material onto the rods. A continuous web 25 of uniting material (e.g. "cork") is fed at a controlled speed by rollers 26 towards a drum 27 which rotates with a peripheral speed greater than the speed of the web. A cutting device 28 cooperates with the drum 27 to cut the web at regular intervals, and the strips 25A cut off the web are carried further on the drum through the action of suction ports in the surface of the drum in a manner similar to that used in our PA8 filter attachment machine (some details of which are described in our U.S. patent 4,044,779); suction in those ports is timed to cease when each strip is applied to the respective rods. Folding of the strips around the rods is started, as soon as possible thereafter, by a tape 29 acted somewhat like a garniture tape in a conventional cigarette making machine.

The completion of folding may be achieved by means of one or more rotary tuckers or by one or more stationary folders or by a combination of both.

Adhesive is preferably applied to the outer
5 surface of the web 25, by means of an applicator roller device 30, before the web reaches the drum 27. Alternatively, timed patches of adhesive may be applied to the strips cut from the web while they are on the drum 27.

The timing of the delivery of the strips to
10 the rods may be controlled as follows. An optical device 31 detects and signals the arrival of the filters, and the signals are used to control the timing or phasing of a motor (not shown) during the strip-feeding parts. For example, the motor may be one of the low-inertia "printed
15 circuit" motors, which can be finely adjusted as to its speed. By this means it is possible to ensure that the strips of uniting material arrive at the rod line appropriately timed in relation to the filter portions. That is to say, any tendency for the positions (i.e. the timing
20 of arrival) of the filters to drift over a period of time can be compensated by appropriate automatic adjustment of the timing of delivery of the strips.

Reference is directed also to our British patent specification No. 814,383, various details from
25 which may be used in carrying out the present invention.

Claims:

1. A method of making double cigarette units comprising the steps of forming a continuous tobacco-filled rod, cutting the rod at regular intervals to form double-length tobacco rods, spacing the tobacco rods apart while
5 they are moving longitudinally, inserting double-length filter portions between successive rods, applying strips of uniting material at regular intervals so that each strip extends along the entire length of a double-filter portion and overlap the adjacent ends of the adjacent tobacco rods,
10 wrapping the strips around the tobacco and filter portions to form a continuous rod comprising alternate double tobacco and filter portions, and then cutting the continuous rod through the middle of each double-filter portion to form the specified double-length cigarette units.
2. A method according to claim 1 in which the double cigarette units are conveyed sideways towards one or more packing machines and are cut through the middle, to form individual filter-tipped cigarettes, at, near or in
5 the packing machine or machines.
3. A method according to claim 1 or claim 2 in which the strips of uniting material are conveyed onto the rods by an air-pervious carrier tape through which suction is applied to hold the strips, and in which the carrier
5 tape bends progressively in cross-section so as to begin the operation of folding the strips around the rods.
4. A method according to claim 3 in which further folding of the strips around the rods is achieved by means

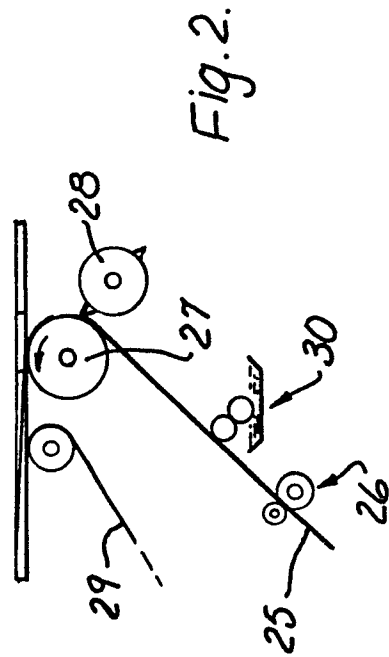
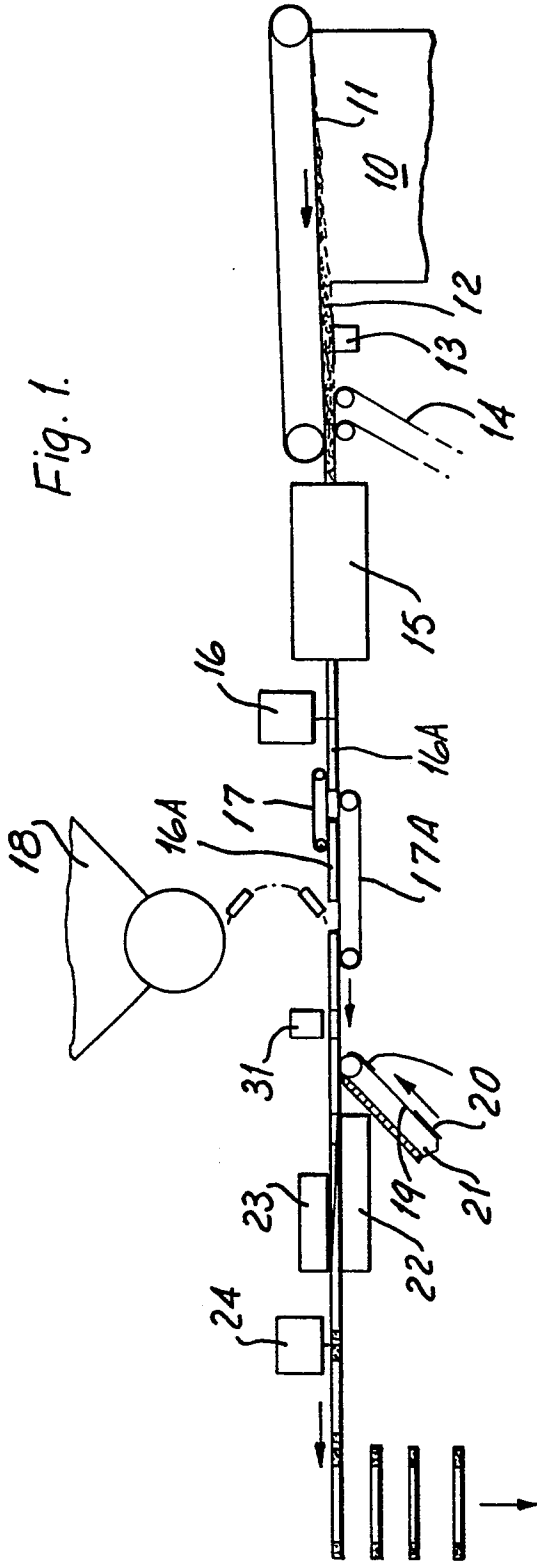
of a rotary member mounted having at least one strip-engaging part which is timed to engage a strip during each revolution of the rotary member.

5. A method according to claim 1 or claim 2 in which the strips are fed onto the rods by a drum and are then partially folded around the rods by a tape.

6. A machine for making double cigarette units, comprising means for forming a continuous tobacco-filled rod, means for cutting the rod at regular intervals to form double-length tobacco rods, means for spacing the tobacco
5 rods apart while they are moving longitudinally, means for inserting double-length filter portions between successive rods, means for applying strips of uniting material at regular intervals so that each strip extends along the entire length of a double-filter portion and overlap the
10 adjacent ends of the adjacent tobacco rods, means for wrapping the strips around the tobacco and filter portions to form a continuous rod comprising alternate double tobacco and filter portions, and then cutting the continuous rod through the middle of each double-filter portion to form
15 the specified double-cigarette units.

7. A machine according to claim 6 including an air-pervious carrier tape which is arranged to carry the strips of uniting material onto the rods by means of suction applied through the tape to hold the strips on the tape,
5 the tape being constrained to bend progressively in cross-section so as to begin the operation of folding the strips around the rods.

8. A machine according to claim 7 including a rotary folding member having at least one strip-engaging part which is timed to engage a strip during each revolution of the rotary member.
9. A machine according to claim 6 in which a drum with suction ports is arranged to feed the adhesive-coated strips onto the rods, and in which a tape is arranged to commence the folding of the strips around the rods.
10. A machine according to any one of claims 6 to 9, in which the tobacco rods are arranged to be spaced apart by a suction conveyor moving at a speed greater than that of the initial continuous rod.





DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)
X	US-A-2 205 943 (DAVISON) *The whole document*	1,3,6-7	A 24 C 5/52
Y	GB-A- 776 256 (KORBER) *Figures 3,5; page 3, lines 18-52*	1,6	
D,A	GB-A-1 584 551 (MOLINS) *Claim 1*	2	
A	GB-A- 782 415 (MOLINS) *Figure 1; page 2, lines 30-52*	5,9	
E	GB-A-1 604 347 (MOLINS) *The whole document*	1-10	
			TECHNICAL FIELDS SEARCHED (Int. Cl. 3)
			A 24 C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 13-08-1982	Examiner RIEGEL R.E.
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			