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(54) Module for converting cigarettes into ventilated cigarettes

(57) A module (1) for converting cigarettes (2) into ventilated cigarettes (2a), wherein a perforating unit (4) is located in series with an input device (5) by which it is supplied with a succession of cigarettes (2); the input device (5) presenting a fixed roller (13), at least one movable roller (32) substantially tangent to the fixed

roller (13), and an adjusting device (33) for adjusting the position of the movable roller (32) about the fixed roller (13), and for so positioning the movable roller (32) as to connect it to the output conveyor roller (22) of a cigarette manufacturing machine (25; 26).

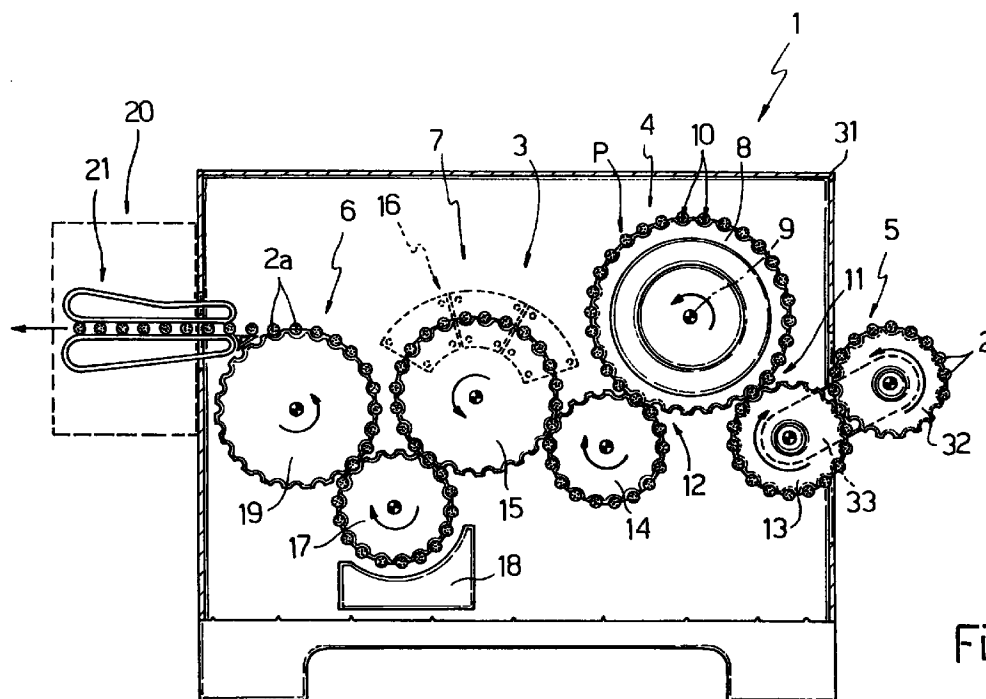


Fig. 1

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Description

The present invention relates to a module for converting cigarettes into ventilated cigarettes.

In general, most cigarette manufacturers produce ventilated cigarettes, which, as is known, present lateral ventilation holes to enable a certain amount of air to be drawn in together with the tobacco smoke to both cool it and reduce the harmful substances contained in it.

Ventilated cigarettes are normally produced on special-purpose machines featuring, along a cigarette conveyor line, a series of processing, handling and control stations, one of which comprises a perforating station featuring mechanical perforating members or a laser perforating member.

As such, ventilated cigarettes can only be produced on special-purpose lines, which, obviously, may also be used for producing non-ventilated cigarettes by simply deactivating the perforating members, whereas a non-ventilated cigarette production line can only be converted to produce ventilated cigarettes at the expense of radical alterations.

This therefore results in a certain degree of rigidity in the design of cigarette manufacturing systems.

It is an object of the present invention to overcome the aforementioned drawback.

According to the present invention, there is provided a module for converting cigarettes into ventilated cigarettes; characterized in that it comprises a cigarette perforating unit; an input device for successively feeding the cigarettes to the perforating unit along a given path; and an output device for the ventilated cigarettes; the input device comprising a first conveyor in a fixed position along said path, at least one second conveyor substantially tangent to the first conveyor, and adjusting means for adjusting the position of the second conveyor about the first conveyor, and for so positioning the second conveyor as to connect it to the output conveyor of a cigarette manufacturing machine.

A non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a side view of a preferred embodiment of the module according to the present invention;

Figure 2 shows a schematic view of the Figure 1 module connected to a filter-tipped cigarette manufacturing machine;

Figure 3 shows a schematic view of the Figure 1 module connected to the output of a plain cigarette manufacturing machine.

Number 1 in Figure 1 indicates a module for converting non-ventilated, filter-tipped or plain cigarettes 2 into ventilated cigarettes 2a. Module 1 comprises a single-cigarette conveyor line 3 extending along a given path P and defined by a perforating unit 4, the input of which is connected to the output of an input conveyor

assembly 5 for single non-ventilated cigarettes 2, and the output of which is connected to an output conveyor assembly 6 for single ventilated cigarettes 2a via an assembly 7 for controlling and rejecting ventilated cigarettes 2a.

Perforating unit 4 may be of any type, but is preferably a laser perforating unit of the type described for example in US Patent n. 5,105,833, and comprising a central drum 8 rotating anticlockwise (in Figure 1) about a substantially horizontal axis 9 perpendicular to the Figure 1 plane. Drum 8 presents a number of peripheral suction seats 10 equally spaced about axis 9, and each of which partially houses a respective cigarette 2 and rotates it in known manner about its axis and along a given perforating arc extending between a loading station 11 interposed between drum 8 and the output of conveyor assembly 5, and an unloading station 12 interposed between drum 8 and the input of assembly 7.

A known laser beam emitter (not shown) provides for forming at least one ring (not shown) of ventilation holes (not shown) in each cigarette 2 as it travels along the perforating arc, and so converting cigarette 2 into a ventilated cigarette 2a.

The output of conveyor assembly 5 and the input of assembly 7 are defined by respective conveyor rollers 13, 14 rotating the opposite way to, and mounted tangent to the outer periphery of, drum 8. Roller 13 provides for feeding cigarettes 2 successively into seats 10 on drum 8, while roller 14 provides for receiving cigarettes 2a at station 12 and transferring them to assembly 7. Assembly 7 comprises a first conveyor roller 15 tangent to roller 14 and for successively feeding cigarettes 2a into engagement with a pneumatic control station 16; and a second conveyor roller 17 tangent to roller 15 and for unloading any rejected cigarettes into a bin 18.

In the example shown, output conveyor assembly 6 is defined by a single conveyor roller 19 tangent to roller 17 and rotating about its axis in the same direction as roller 15 and drum 8, and in the opposite direction to rollers 14 and 17.

At its output end, module 1 is normally connected to an output module 20 substantially similar to those normally provided at the output of cigarette manufacturing machines. In the example shown, module 20 comprises a conveyor belt 21 of the type described for example in European Patent n. 627,176, and for receiving a succession of single cigarettes 2a from roller 19, and transferring them to the input of a bulk conveyor (not shown).

In actual use, input conveyor assembly 5 of module 1 is connected to the output conveyor roller 22 of a cigarette manufacturing assembly 23, so as to define, with assembly 23 and module 20, a line 24 for producing ventilated cigarettes 2a.

In the example shown in Figure 2, assembly 23 comprises, at its output, a filter assembly machine 25, of which roller 22 forms the output roller. In the Figure 3 example, assembly 23 comprises a dual-rod machine 26 for producing plain cigarettes 2; and a transfer unit

27 presenting output roller 22, and which provides for removing cigarettes 2 from the output beam 28 of machine 26 by means of a pickup device 29 preferably of the type described in US Patent n. 5,267,577.

To adapt to the level of roller 22, which may vary from one manufacturing machine to another, in addition to roller 13 which is fitted to the frame 31 of module 1 with its axis 30 in a fixed position, input conveyor assembly 5 also comprises a movable conveyor roller 32 tangent to roller 13 and fitted in rotary manner to one end of a rocker arm 33 pivoting about axis 30 and which is fixed in position by a known angular clamping device (not shown). By adjusting the angular position of arm 33 about axis 30, roller 32 may be rotated about the periphery of roller 13 into a position tangent to the periphery of roller 22.

According to a variation not shown, in the event roller 22 rotates in the opposite direction to that shown in Figures 2 and 3, a further conveyor roller (not shown) is fitted to arm 33 and interposed between rollers 32 and 13, to maintain the Figure 1 rotation direction of drum 8 and, hence, as long a perforating arc as possible about the drum.

As such, a line (not shown) for producing non-ventilated cigarettes 2 and featuring an output module 20 may be converted into a line 24 for producing ventilated cigarettes 2a by simply removing module 20, connecting module 1 to roller 22, and reassembling module 20 at the output of module 1.

Obviously, to also render the level of conveyor 21 of output module 20 adjustable, also roller 19 is to be a movable roller (not shown) similar to roller 32, and is to be fitted to a rocker arm (not shown) similar to arm 33 and pivoting about the axis of roller 19.

Claims

1. A module (1) for converting cigarettes (2) into ventilated cigarettes (2a); characterized in that it comprises a cigarette perforating unit (4); an input device (5) for successively feeding the cigarettes (2) to the perforating unit (4) along a given path (P); and an output device (6) for the ventilated cigarettes (2a); the input device (5) comprising a first conveyor (13) in a fixed position along said path (P), at least one second conveyor (32) substantially tangent to the first conveyor (13), and adjusting means (33) for adjusting the position of the second conveyor (32) about the first conveyor (13), and for so positioning the second conveyor (32) as to connect it to the output conveyor (22) of a cigarette manufacturing machine (25; 26).
2. A module as claimed in Claim 1, characterized in that said first conveyor (13) is defined by a first conveyor roller (13) rotating about its axis (30) to successively feed the cigarettes (2) to said perforating unit (4) at a loading station (11); said second conveyor in turn being defined by a second conveyor

roller (32) fitted to said adjusting means (33) and movable, by said adjusting means (33), along the periphery of said first roller (13).

3. A module as claimed in Claim 2, characterized in that said adjusting means (33) comprise a rocker arm (33) pivoting about said axis (30).
4. A module as claimed in Claim 3, characterized in that it also comprises a ventilation control assembly (7) downstream from said perforating unit (4).
5. A module as claimed in any one of the foregoing Claims, characterized in that said perforating unit (4) is a laser perforating unit.
6. A line (24) for manufacturing ventilated cigarettes (2a), and comprising a machine (25)(26) for manufacturing non-ventilated cigarettes (2), and an output module (20) for a succession of ventilated cigarettes (2a); characterized in that it comprises a perforating module (1) as claimed in any one of the foregoing Claims; the perforating module (1) being interposed between the manufacturing machine (25; 26) and said output module (20).
7. A line as claimed in Claim 6, characterized in that said manufacturing machine (25; 26) presents an output conveyor (22); said adjusting means (33) being so adjusted as to position said second conveyor (32) of said input device (5) tangent to said output conveyor (22).

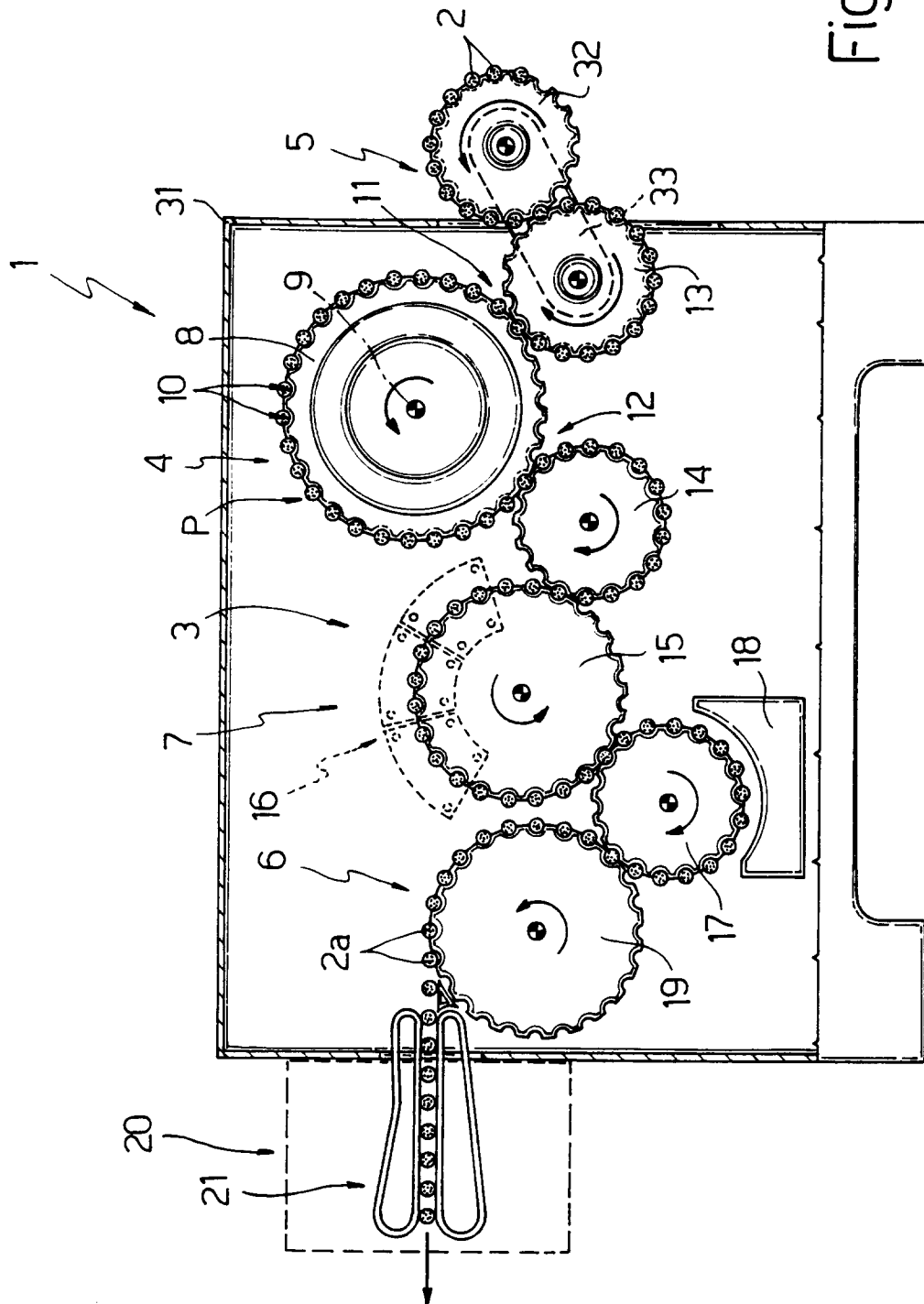


Fig. 1

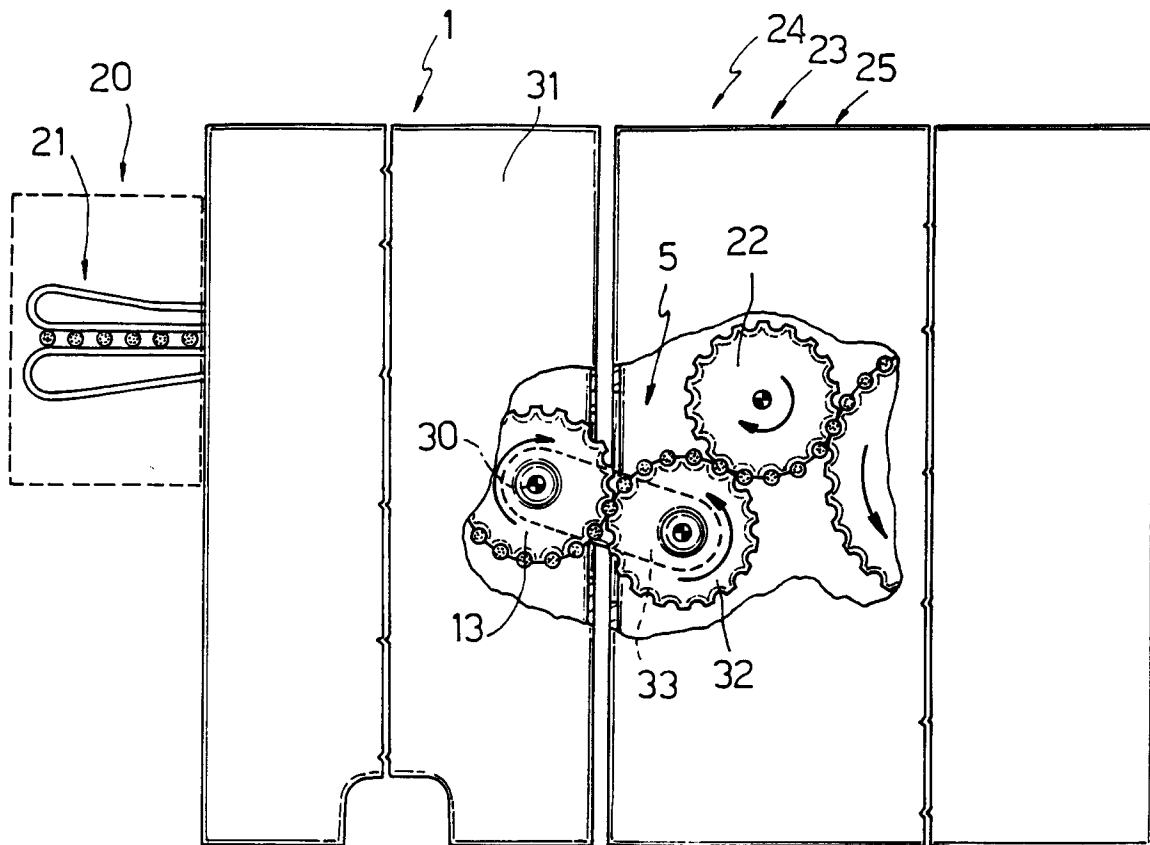


Fig. 2

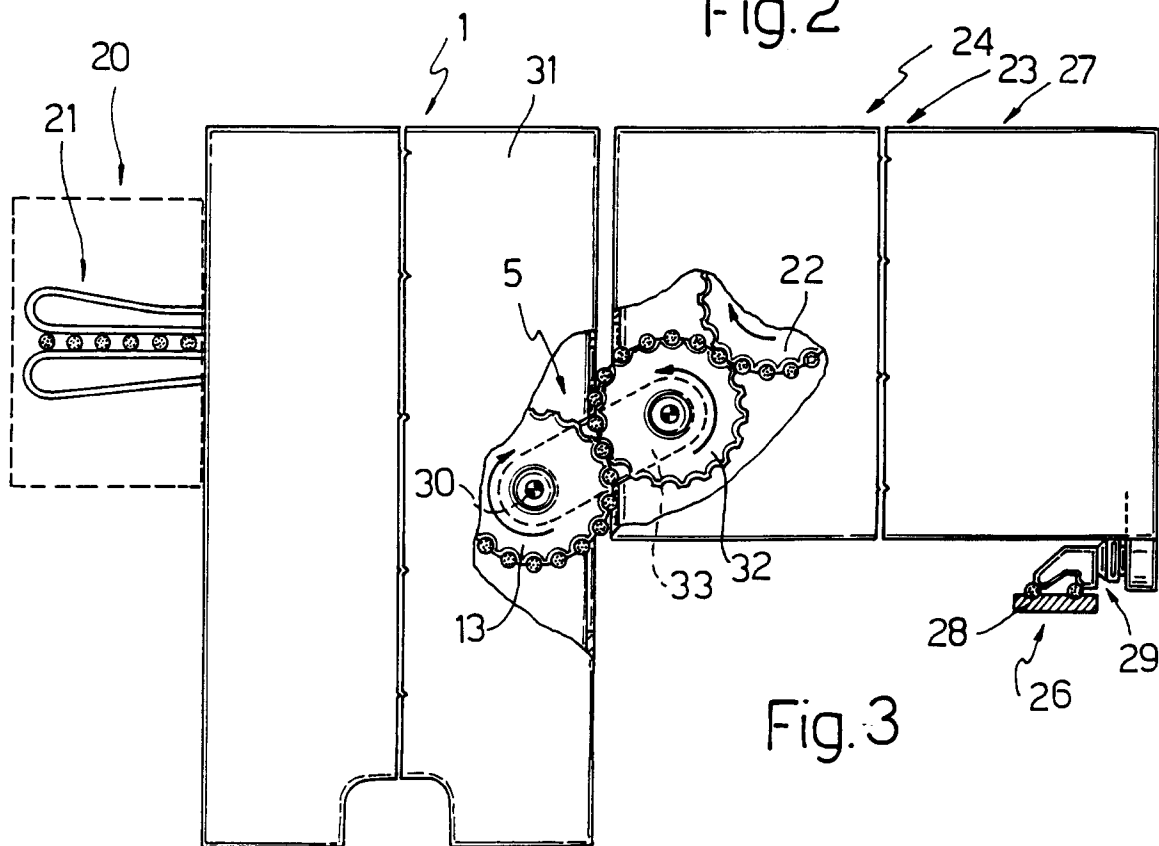


Fig. 3



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EUROPEAN SEARCH REPORT

Application Number
EP 96 10 3944

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.6)
A	EP-A-0 627 175 (G.D. SOCIETA' PER AZIONI) * the whole document *	1	A24C5/32 A24C5/60
A,D	US-A-5 105 833 (MATTEI) * the whole document *	1	
A	GB-A-1 159 791 (MOLINS MACHINE COMPANY LIMITED) -----		
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			A24C
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		8 July 1996	Riegel, R
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