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(54) Combined manufacturing-filter assembly unit for producing filter-tipped cigarettes.

(57) A combined manufacturing-filter assembly unit (1) for producing filter-tipped cigarettes, wherein one frame (2) supports a U-shaped manufacturing line (3) presenting a first and second branch (4, 5) arranged substantially side by side and parallel to each other, and an intermediate transverse branch (6) connecting the output of the first branch (4) to the input of the second branch (5); the first branch (4) being defined by a line (7) for producing cigarette portions (8); the second branch (5) being defined by a line (9) for connecting the cigarette portions (8) to respective filters and so producing filter-tipped cigarettes; and the intermediate branch (6) being defined by a transfer unit (10), the output of which is defined by a device (37) for rotating the cigarette portions (8) substantially 90° about an axis perpendicular to their own axis prior to feeding them to the second branch (5).

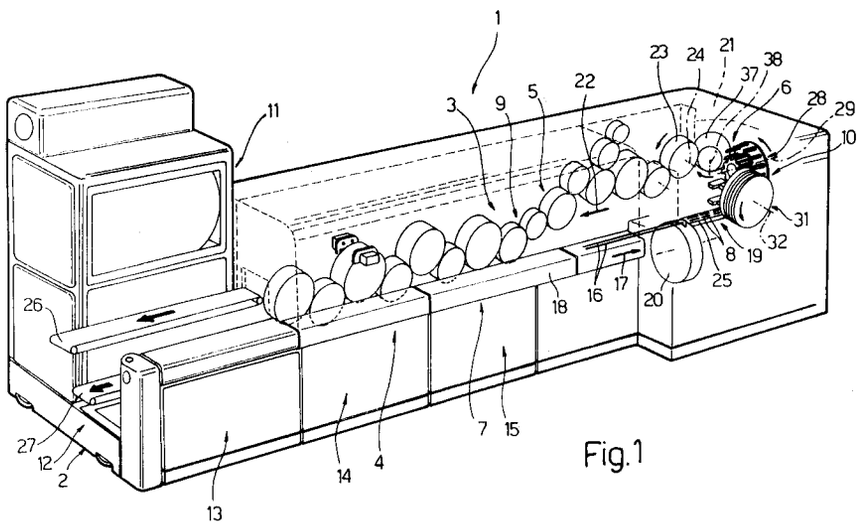

Fig.1

EP 0 641 524 A1

The present invention relates to a combined manufacturing-filter assembly unit for producing filter-tipped cigarettes.

Filter-tipped cigarette manufacturing lines are known to feature a cigarette manufacturing machine connected in series with at least one filter assembly machine via a transfer device; which lines, by comprising two or more in-line machines, are invariably cumbersome and require at least one operator for each machine.

It is an object of the present invention to provide a compact filter-tipped cigarette manufacturing line which may be controlled by one operator.

According to the present invention, there is provided a combined manufacturing-filter assembly unit for producing filter-tipped cigarettes, characterized in that it comprises a frame; and a U-shaped manufacturing line supported on the frame and in turn comprising a first and second branch arranged substantially side by side and parallel to each other, and an intermediate transverse branch connecting the output of the first branch to the input of the second branch; the first branch being defined by a line for producing cigarette portions; the second branch being defined by a filter assembly line for connecting the cigarette portions to respective filters and so forming filter-tipped cigarettes; and the intermediate branch being defined by a transfer unit comprising a position change device for rotating the cigarette portions substantially 90° about an axis perpendicular to their own axis.

According to a preferred embodiment of the above unit, the transfer unit comprises an intermediate transfer member for feeding the cigarette portions transversely along the intermediate branch, and presenting seats, parallel to the first branch, for receiving respective cigarette portions; an input transfer member along the output end of the first branch, for successively removing the cigarette portions from the first branch and feeding them longitudinally, and parallel to themselves, into respective seats on the intermediate transfer member; and an output transfer member connected to the intermediate transfer member and comprising the position change device.

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 schematic view in perspective, with parts removed for clarity, of a preferred embodiment of the combined unit according to the present invention;

Figure 2 shows a larger-scale, partially sectioned plan view, with parts removed for clarity, of a detail in Figure 1.

Number 1 in Figure 1 indicates a combined manufacturing-filter assembly unit for producing filter-tipped cigarettes.

Unit 1 comprises a frame 2; and a U-shaped line 3 for manufacturing filter-tipped cigarettes and supported on frame 2. Line 3 comprises a first and second branch 4 and 5 arranged substantially side by side and parallel to each other; and an intermediate transverse branch 6 connecting the output of branch 4 to the input of branch 5. Branch 4 is defined by part of a line 7 for producing cigarette portions 8; branch 5 is defined by a filter assembly line 9 for connecting cigarette portions 8 to respective filters (not shown) and so forming filter-tipped cigarettes (not shown); and intermediate branch 6 is defined by a transfer unit 10 for rotating the cigarette portions substantially 90° about an axis perpendicular to their own axis.

Line 7 is a known type of manufacturing line which, in the example shown, is a dual-rod cigarette manufacturing line of the type described in US Patent n. 4,336,812, and comprises a unit 11 for feeding a stream of shredded tobacco (not shown) to a bottom transverse conveyor unit 12 by which the stream of tobacco is transferred to the bottom end of a lift unit 13 of the type described in the above US patent. Inside lift unit 13, the stream of shredded tobacco (not shown) is divided in known manner (not shown) into two identical streams (not shown) which are fed on to the underside of respective known conveyor belts (not shown) to form two tobacco layers (not shown) which are in turn fed by the respective conveyor belts (not shown) through an adjusting unit 14 and a unit 15 for forming two continuous cigarette rods 16 traveling in a longitudinal direction 17 parallel to branch 4. Inside adjusting unit 14, the thickness of the two layers (not shown) is adjusted in known manner by shaving devices (not shown, and of the type described for example in US Patent n. 4,304,243); and, inside forming unit 15 (preferably of the type described in US Patent n. 4,336,812), the two tobacco layers (not shown) are deposited on to respective paper strips (not shown) and fed along a beam 18 for forming cigarette rods 16.

Along the output portion 19 of line 7, the two cigarette rods 16 are fed in direction 17 through a cutting head 20, preferably of the type described in US Patent n. 4,398,438, by which they are cut into respective successions of cigarette portions 8.

As shown in Figure 1, manufacturing line 7 extends along a front portion of the machine, beneath a cover 21 common to both lines 7 and 9; whereas filter assembly line 9 is located alongside line 7, and extends parallel to line 7 in a backed-up position in relation to the front portion of the machine, and at a level on average higher than that of line 7 to permit one operator to simultaneously control both lines 7 and 9. More specifically, line 9 extends in a direction 22 substantially parallel to but opposite direction 17, and comprises an input

roller 23 fitted to frame 2 so as to rotate about an axis 24 substantially perpendicular to direction 22 and at a higher level as compared with conveyor surface 25 for transporting cigarette portions 8 downstream from cutting head 20.

Line 9 is a known filter assembly line (e.g. of the type described in US Patent n. 5,033,482) for feeding a succession of filter-tipped cigarettes (not shown) on to an output conveyor 26 extending in direction 22 between units 11 and 13 and over both unit 12 and an unloading conveyor 27 parallel to conveyor 26 and which provides for disposing of any cigarettes rejected along line 9.

As shown in Figure 1 and particularly in Figure 2, transfer unit 10 comprises an intermediate transfer member for feeding cigarette portions 8 transversely along intermediate branch 6 and consisting of a roller 28 fitted to frame 2 so as to rotate about an axis 29 parallel to branch 4 and substantially on a level with axis 24. Roller 28 is of the type described in German Patent OS P 42 03 517.1, and presents seats 30 parallel to branch 4 and for receiving respective cigarette portions 8.

Unit 10 also comprises an input transfer member 31 rotating about an axis 32 perpendicular to branch 4, located along output portion 19 of line 7, and substantially coplanar with axes 24 and 29. Transfer member 31 is of the type described in said German Patent OS P 42 03 517.1, and provides for successively removing cigarette portions 8 from line 7 and feeding them longitudinally, and parallel to themselves, into respective seats 30 on roller 28. As shown in Figure 2, transfer member 31 comprises a cylindrical platform 33 fitted to a drive shaft 34 coaxial with axis 32; and a number of shafts 35 projecting from platform 33 and each presenting a pickup head 36 moving along a path tangent to surface 25 and which provides for removing two cigarette portions 8 off surface 25 and transferring them into respective seats 30 on roller 28. Platform 33 houses in known manner a drive (not shown) for rotating shafts 35 in the same manner but in the opposite direction to platform 33, so that heads 36 are maintained parallel to themselves at all times along said path.

Unit 10 also comprises an output transfer member connected to roller 28 and consisting of a truncated-cone-shaped roller 37 rotating about an axis 38 substantially coplanar with axes 24, 29 and 32, and presenting an angle of roughly 90°. Roller 37 is tangent to both roller 28 and input roller 23 of filter assembly line 9, and provides for rotating cigarette portions 8 substantially 90° about an axis perpendicular to their own axis prior to feeding them on to roller 23.

Operation of unit 1 is easily deducible from the accompanying drawings and therefore requires no further description. One point to note, however, is that filter assembly line 9, in addition to extending alongside and further back in relation to line 7 for enabling considerable space saving, is also, on average, raised in relation to line 7 by an amount substantially equal to the radius of platform 33, to permit troublefree observation and intervention by the operator stationed in front of unit 1.

Claims

1. A combined manufacturing-filter assembly unit for producing filter-tipped cigarettes, characterized in that it comprises a frame (2); and a U-shaped manufacturing line (3) supported on the frame (2) and in turn comprising a first and second branch (4, 5) arranged substantially side by side and parallel to each other, and an intermediate transverse branch (6) connecting the output of the first branch (4) to the input of the second branch (5); the first branch (4) being defined by a line (7) for producing cigarette portions (8); the second branch (5) being defined by a filter assembly line (9) for connecting the cigarette portions (8) to respective filters and so forming filter-tipped cigarettes; and the intermediate branch (6) being defined by a transfer unit (10) comprising a position change device (37) for rotating the cigarette portions (8) substantially 90° about an axis perpendicular to their own axis.

2. A unit as claimed in Claim 1, characterized in that said transfer unit (10) comprises an intermediate transfer member (28) for feeding the cigarette portions (8) transversely along the intermediate branch (6), and presenting seats (30) parallel to the first branch (4) and for receiving respective cigarette portions (8); an input transfer member (31) located along the output end (19) of the first branch (4), for successively removing the cigarette portions (8) from the first branch (4) and feeding them longitudinally, and parallel to themselves, into respective seats (30) on the intermediate transfer member (28); and an output transfer member (37) connected to the intermediate transfer member (28) and comprising the position change device (37).

3. A unit as claimed in Claim 2, characterized in that the intermediate transfer member (28) comprises an intermediate transfer roller (28) rotating about an axis (29) parallel to the first branch (4) and at a higher level than said output end (19) of the first branch (4).

4. A unit as claimed in Claim 3, characterized in that the input transfer member (31) rotates

about an axis (32) perpendicular to the first branch (4).

5. A unit as claimed in Claim 3 or 4, characterized in that the filter assembly line (9) comprises an input roller (23) rotating about an axis (24) perpendicular to the second branch (5); the output transfer member (37) comprising a truncated-cone-shaped roller (37) presenting an angle of substantially 90° and tangent to both the intermediate transfer roller (28) and the input roller (23) of the filter assembly line (9).

6. A unit as claimed in Claim 5, characterized in that the rotation axes (38, 29, 24) of the truncated-cone-shaped roller (37), the intermediate transfer roller (28) and the input roller (23) of the filter assembly line (9) are substantially coplanar.

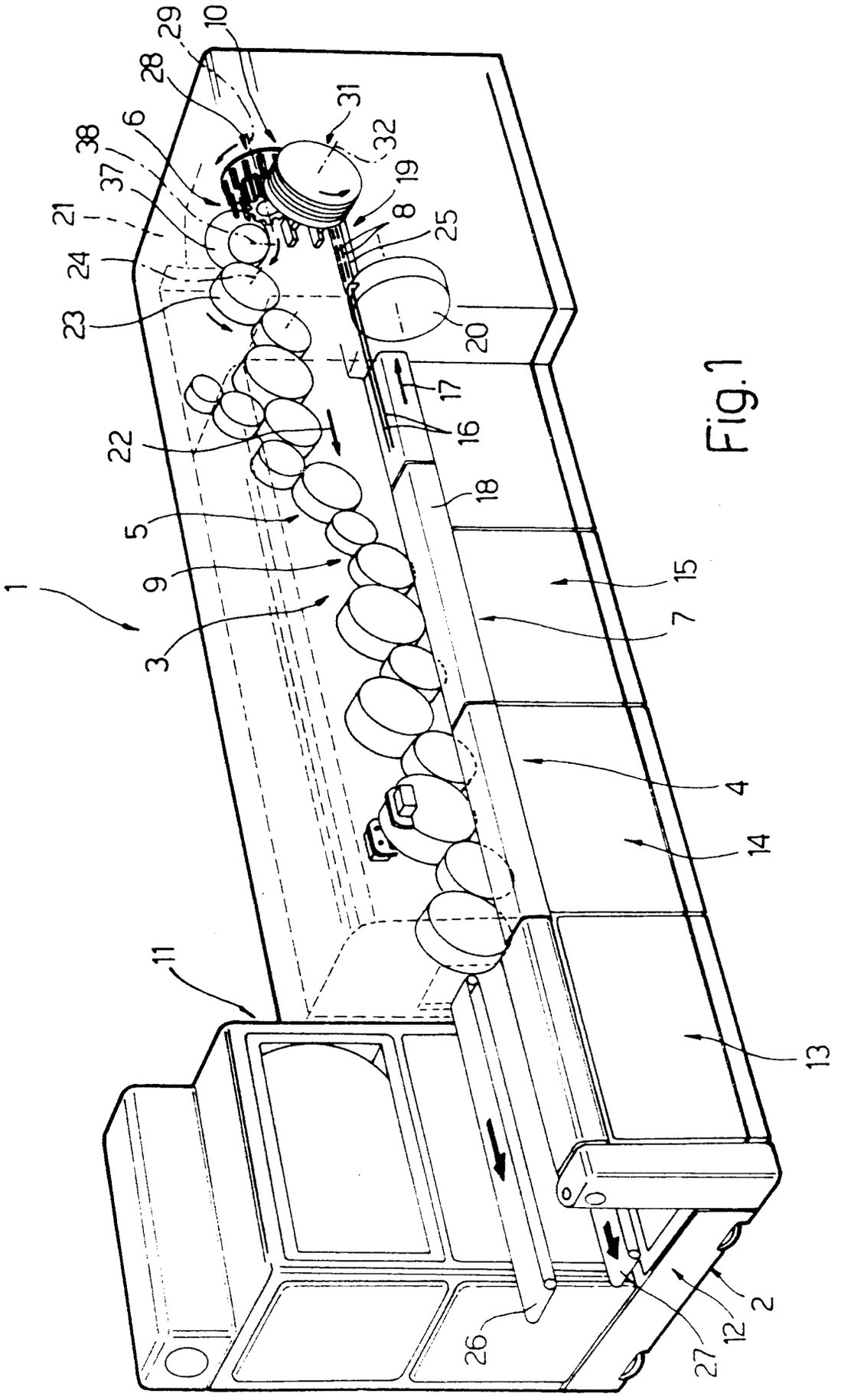
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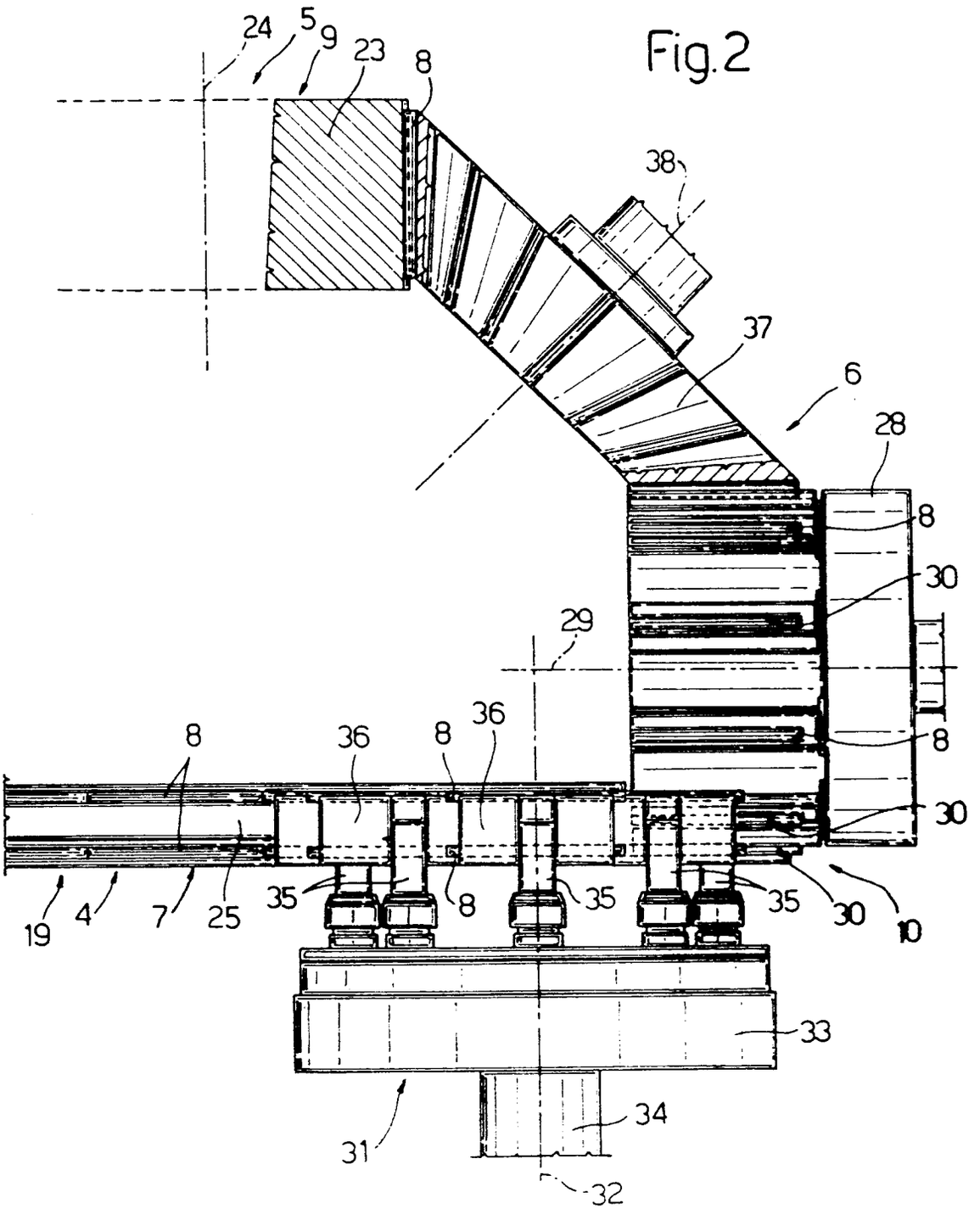
Fig.1

Fig.2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EUROPEAN SEARCH REPORT

Application Number
EP 94 11 3630

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	US-A-4 807 738 (WHELESS) * the whole document * ---	1	A24C5/47 A24C5/32 A24C5/33
A	US-A-4 372 436 (ACHELPOHL) * the whole document * ---	1	
A	US-A-3 485 337 (EVERHART) * column 6, line 13 - line 73; figure 5 * ---	5	
A,D	DE-A-42 03 517 (G.D.S.P.A.) -----		

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	2 December 1994	Riegel, R

CATEGORY OF CITED DOCUMENTS

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