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None

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(54) Shaving devices for dual-rod machines

(57) A dual-rod cigarette manufacturing machine (2) wherein two streams of tobacco (24,25), retained by suction on parallel conveyor belts, are subjected to the action of respective shaving devices (28,29) prior to being wrapped in strips of cigarette paper; each of the aforementioned shaving devices (28,29) comprising two tangent, coplanar, counter-rotating discs (37,38; 37', 38') having respective cutting edges, and the respective shafts of which are parallel, inclined vertically at a given angle, and lie in a plane substantially perpendicular to the two tobacco streams (24,25).

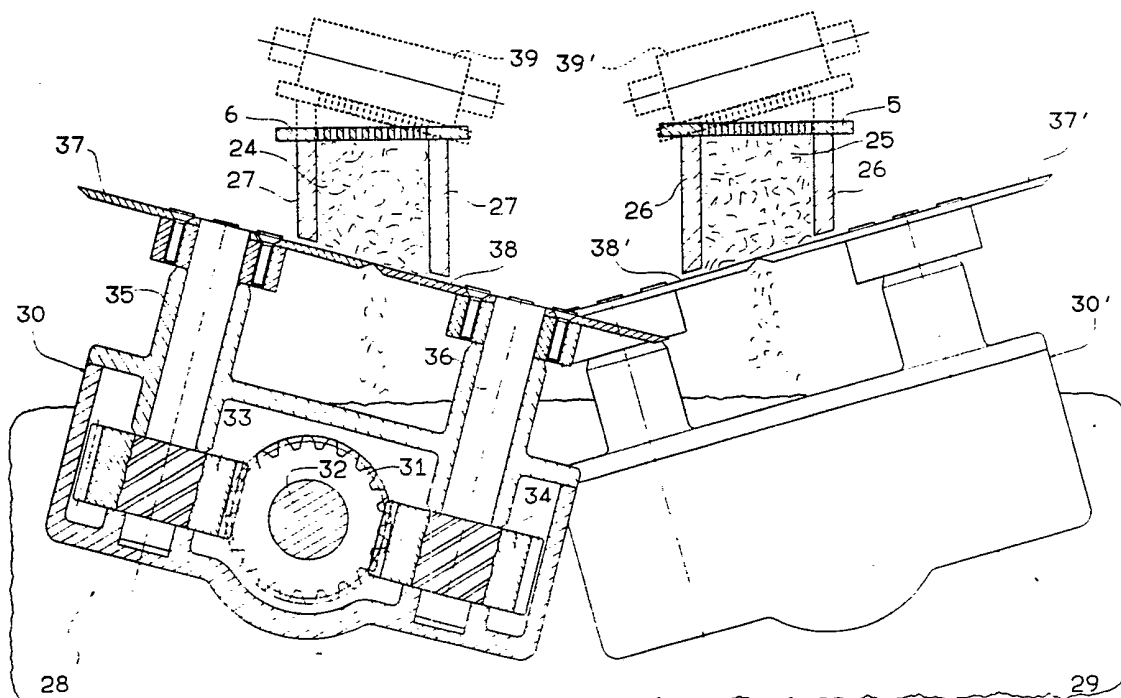


FIG. 2

The drawing(s) originally filed was (were) informal and the print here reproduced is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1982.

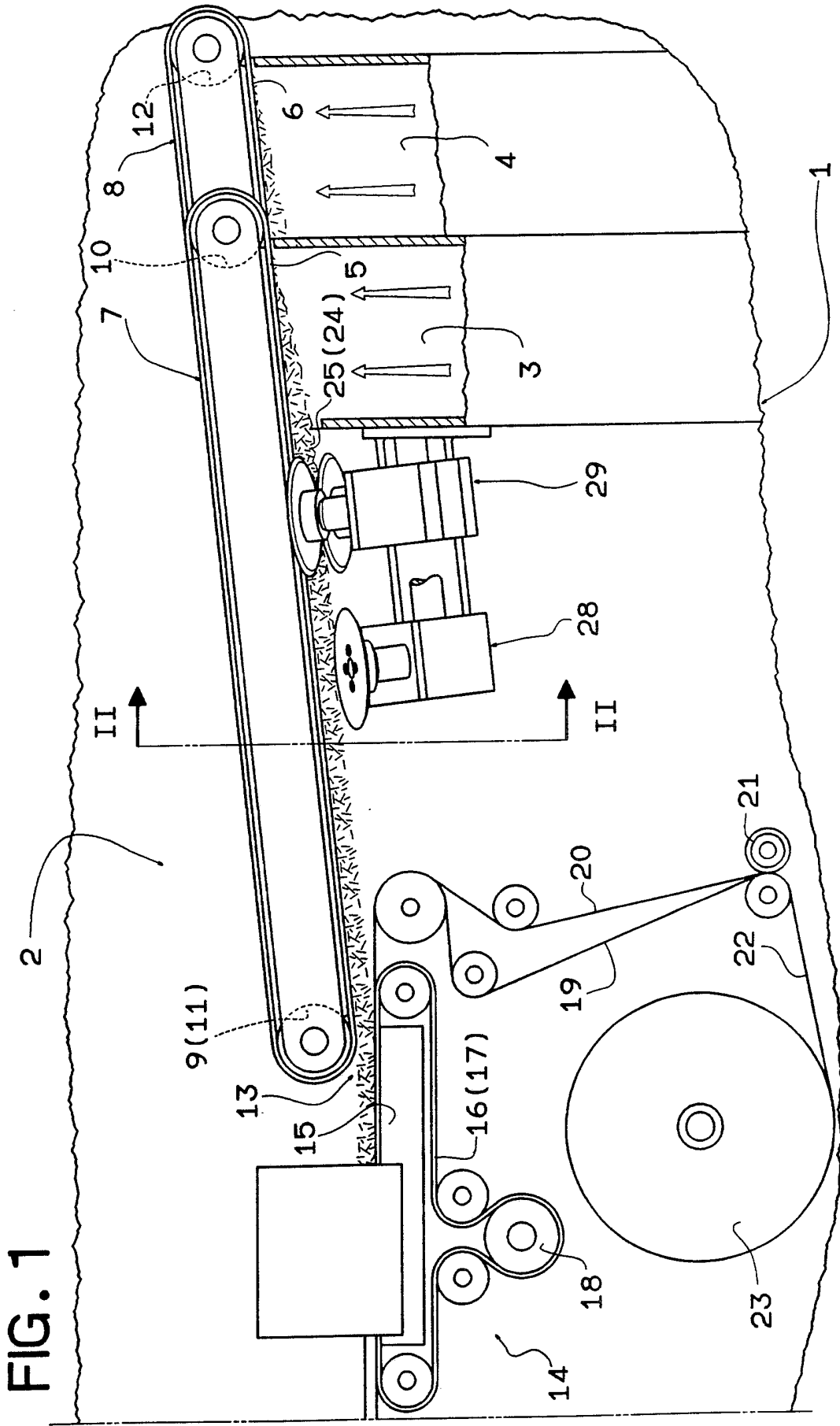


FIG. 1

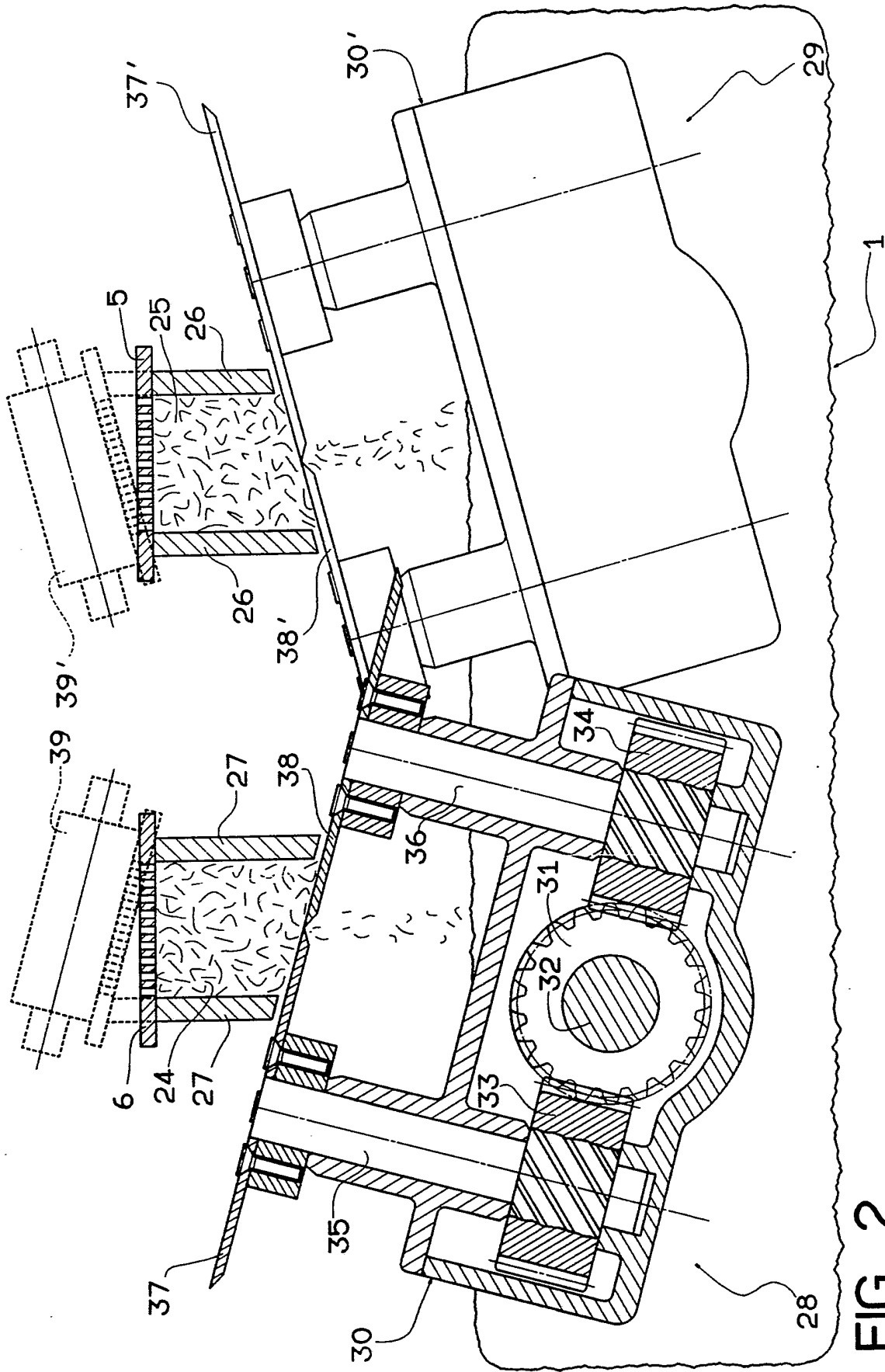


FIG. 2

DUAL-ROD CIGARETTE MANUFACTURING MACHINE

The present invention relates to a dual-rod cigarette manufacturing machine.

- 5 In particular, the present invention relates to the so-called shaving devices which, on such machines, operate on the streams of shredded tobacco from which, subsequent to a wrapping operation, the so-called continuous cigarette rods are formed.
- 10 On such machines, as described in USA Patent N° 4.336.812 filed by the present Applicant, two streams of tobacco are formed by accumulating tobacco particles underneath respective supports consisting of parallel suction type conveyor belts.
- 15 As it travels along the respective said conveyor belt to cigarette forming means, each tobacco stream is subjected to a so-called shaving operation for rendering the thickness of the stream substantially constant.
- On single-rod cigarette manufacturing machines, the so-called shaving devices by which the above operation is
- 20

performed consist of two identical, coplanar discs, mounted on counter-rotating vertical shafts, having respective cutting edges, and arranged tangent to each other along the route traveled by the said tobacco stream.

5 Shaving devices of the aforementioned type, however, are too cumbersome for use on dual-rod cigarette manufacturing machines, by virtue of the said two streams of tobacco, retained on respective conveyor belts, traveling only a small distance apart; which distance is imposed by the
10 construction design of the machine and cannot be increased. To be more precise, if a shaving device of the aforementioned type were to be installed for each of the said two tobacco streams, the disc between the said two conveyor belts would interfere with the path of the second
15 stream, thus preventing it from being fed to the said cigarette forming means.

For this reason, and as described in USA Patent N° 4.304.243 filed by the present Applicant, the shaving devices on dual-rod cigarette manufacturing machines consist of
20 pairs of identical truncated-cone discs mounted on inclined, downward-converging shafts. The said discs present respective tangent cutting edges on the wider ends, and respective generating lines aligned along the route of the respective tobacco stream. Consequently, the discs
25 on each shaving device are inclined downwards from the point of contact with the said tobacco stream, thus preventing any interference with the second stream by the disc facing the same.

The grinding of truncated-cone discs of the aforementioned
30 type, however, has been found to involve serious diffi-

culties as compared with the flat discs employed on single-rod cigarette manufacturing machines.

The aim of the present invention is to provide an efficient shaving device employable on dual-rod cigarette
5 manufacturing machines, and involving none of the grinding problems typically associated with shaving devices featuring truncated-cone discs.

With this aim in view, according to the present invention, there is provided a dual-rod cigarette manufacturing machine comprising means for forming two continuous streams
10 of tobacco; two substantially parallel, coplanar conveyor belts for transferring the said tobacco streams to an unloading position; and, along the route of each of the said two conveyor belts, a device for shaving one of the said
15 tobacco streams, and consisting of a pair of counter-rotating discs respectively located inside and outside the space between the said tobacco streams, having respective cutting edges, and arranged with the said cutting edges substantially tangent along the path of the respective
20 said tobacco streams, the shafts of the said discs lying in a plane substantially perpendicular to the traveling direction of the said tobacco streams; characterised by the fact that, on each said shaving device, the shafts of the said pair of discs are substantially parallel,
25 and inclined vertically at a given angle.

The present invention will be described by way of example with reference to the accompanying drawings, in which :

Fig.1 shows a schematic view of a dual-rod cigarette manufacturing machine in accordance with the teachings
30 of the present invention;

Fig.2 shows a larger-scale section along line II-II in Fig.1 of two shaving devices forming part of the Fig.1 machine.

Number 1 in Fig.1 indicates the bed of a dual-rod cigarette manufacturing machine indicated as a whole by 2. Numbers 3 and 4 indicates two ducts fed from below with a continuous stream of tobacco particles by means not shown.

By virtue of a rising air current produced by a suction source (not shown), the said tobacco particles flow up ducts 3 and 4 on to the bottom branches 5 and 6 of respective suction type conveyor belts 7 and 8 looped about respective end rollers 9, 10 and 11, 12. Coaxial end rollers 9 and 11 are powered so as to turn clockwise (Fig.1), and are located lower down in relation to rollers 10 and 12, so that the said bottom branches 5 and 6 travel downwards. The said two bottom branches 5 and 6 closing the outlets of ducts 3 and 4 extend leftwards up to a so-called unloading position 13 where the tobacco is fed to section 14 of machine 2. The said unloading position 13 is located at the confluence of the said branches 5 and 6 and the respective top branches, running over horizontal surface 15, of two conveyor belts 16 and 17 (only one of which is shown in Fig.1) looped about end rollers and powered by an anticlockwise-rotating roller 18.

Numbers 19 and 20 indicated two strips of cigarette paper obtained by longitudinally cutting, by means of a rotary cutter 21, a strip 22 fed off a reel 23.

The said ducts 3 and 4 provide for accumulating tobacco particles and so forming respective continuous streams

of tobacco 24 and 25 on respective suction branches 6 and 5 (also shown in Fig.2). At the said unloading position 13, the said tobacco streams 24 and 25 are unloaded respectively on to paper strips 19 and 20.

5 As they travel along surface 15, the said strips 19 and 20 are gradually wrapped by a guide means (not shown) about the said two tobacco streams 24 and 25, so as to form two continuous cigarette rods, which are subsequently cut into cigarette lengths by a cutting device (not
10 shown).

As shown also in Fig.2, outside the said two ducts 3 and 4 and upstream from the said unloading position 13, tobacco streams 24 and 25 are retained by suction on branches 5 and 6, and confined laterally by respective walls
15 26 and 27 beneath which two shaving devices 28 and 29 operate respectively on the bottom portion of streams 24 and 25.

As the said shaving devices 28 and 29 are identical, the following description will refer solely to device 28, the
20 component parts of device 29 in Fig.2 being indicated using the same numbering system plus an index sign.

Shaving device 28 comprises a box-shaped body or support
30 resting on bed 1 of machine 2 and housing a gear 31 mounted on a horizontal shaft 32 connected by transmission
25 means (not shown) to drive means (not shown) on machine 2. The said gear 31 meshes with two gears 33 and 34 fitted on to the respective bottom ends of two parallel shafts
35 and 36 lying in a plane substantially perpendicular to the traveling direction of tobacco stream 24, and in-
30 clined vertically so that they and the corresponding shaft

pair on shaving device 29 converge upwards in the direction of a vertical plane parallel with tobacco streams 24 and 25 and between conveyor belts 7 and 8.

The top ends of shafts 35 and 36, outside body 30, are fitted with respective coplanar, counter-rotating discs 37 and 38 having respective cutting edges and arranged tangent to each other along the path of tobacco stream 24.

By virtue of the inclination of shafts 35 and 36, discs 37 and 38 lie in a plane forming a given angle with the horizontal plane containing branches 5 and 6. To be more precise, and as shown in Fig.2, the planes containing pairs of discs 37, 38 and 37', 38' intersect below branches 6 and 5, along a straight line parallel with an equidistant in relation to tobacco streams 24 and 25.

It will be noted that, in the embodiment shown of shaving devices 28 and 29, tobacco streams 24 and 25 present a rectangular trapezoidal section, which is later converted into a circular section by compacting the tobacco in streams 24 and 25 as the latter travel through the said guide means (not shown). For producing tobacco streams 24 and 25 having a more regular cross section, similar to the rectangular cross section typical of known cigarette manufacturing machines, this may be achieved by simply placing on bottom branches 6 and 5 of conveyor belts 8 and 7, substantially over the operating location of shaving devices 28 and 29, respective positioning means consisting of two rollers 39 and 39' (as shown by the dotted lines in Fig.2) having their respective axes perpendicular to the respective tobacco stream 24, 25, and

parallel with the plane containing discs 37, 38 or 37', 38' of respective shaving device 28 or 29. The function of the said rollers 39 and 39' is to maintain the bottom branches 6 and 5 of conveyor belts 8 and 7, at the shaving location, inclined in planes parallel to those containing disc pairs 37, 38 and 37', 38', thus enabling the formation of tobacco streams having a cross section substantially in the form of a rhombus.

The advantages of the present invention will be clear from the foregoing description. As on known devices featuring truncated-cone discs, discs 38 and 38' of shaving devices 28 and 29 located between tobacco streams 24 and 25 are arranged in such a manner as to present no interference with the path of tobacco stream 24, 25 not being operated on by the same. Furthermore, being flat, discs 37, 38, 37' and 38' are easy to grind, thus overcoming the drawbacks typically associated with truncated-cone discs employed on known dual-rod cigarette manufacturing machines.

CLAIMS

1) - A dual-rod cigarette manufacturing machine comprising means for forming two continuous streams
5 of tobacco; two substantially parallel, coplanar conveyor belts for transferring the said tobacco streams to an unloading position ; and, along the route of each of the said two conveyor belts , a device for shaving one of the said tobacco
10 streams , and consisting of a pair of counter-rotating discs respectively located inside and outside the space between the said tobacco streams , having respective cutting edges, and arranged with the said cutting edges substantially tangent
15 along the path of the respective said tobacco stream , the shafts of the said discs lying in a plane substantially perpendicular to the traveling direction of the said tobacco streams ; characterised by the fact that, on each said shaving device
20 , the shafts of the said pair of discs are substantially parallel, and inclined vertically at a given angle.

2) - A cigarette manufacturing machine as claimed in Claim 1, characterised by the fact that the shafts of each said
25 pair of discs are inclined by a given angle in relation to those of the other said pair; the said shafts of the said pairs of discs converging upwards in the direction of a vertical plane parallel with the said tobacco streams and located
30 ed between the said conveyor belts .

3) - A cigarette manufacturing machine as claimed in Claim
1 or 2, characterised by the fact that it comprises means
for positioning branches of the said con-
veyor belts in such a manner that, at least at the
5 operating location of the said shaving devices ,
the said branches lie in a plane substantially pa-
rallel with that of the respective said pair of discs.

4) - A dual-rod cigarette manufacturing machine substan-
10 tially as described and illustrated herein with reference
to the accompanying drawings.