

[54] **PRODUCTION OF SMOKING ARTICLES**

[75] Inventor: **Donald B. Naylor**, Southampton, England

[73] Assignee: **Brown & Williamson Tobacco Corporation**, Louisville, Ky.

[22] Filed: **Dec. 4, 1972**

[21] Appl. No.: **311,649**

[52] U.S. Cl. **131/84 C**

[51] Int. Cl. **A24c 05/18**

[58] Field of Search **131/8, 14, 21 D, 84 B, 131/84 C**

[56] **References Cited**

UNITED STATES PATENTS

1,721,117	7/1929	Hopkins.....	131/14 X
1,829,559	10/1931	Gilliam.....	131/8 R
2,162,443	6/1939	Muller.....	131/21 R
3,032,041	5/1962	Lanore.....	131/84 C X
3,088,467	5/1963	Lanore.....	131/84 C X
3,477,442	11/1969	Hooper.....	131/84 C
3,732,871	5/1973	Molins et al.	131/84 C

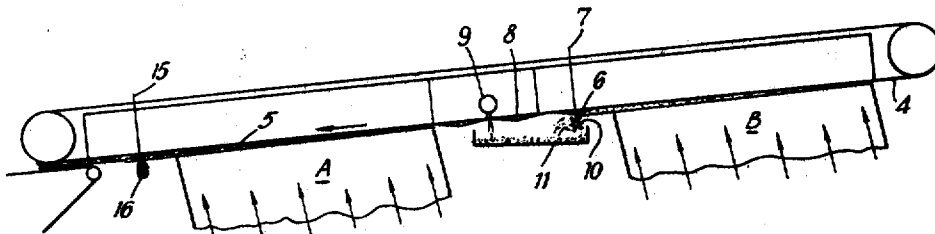
3,736,941	6/1973	Molins et al.	131/84 C
3,759,267	9/1973	Thornton.....	131/14

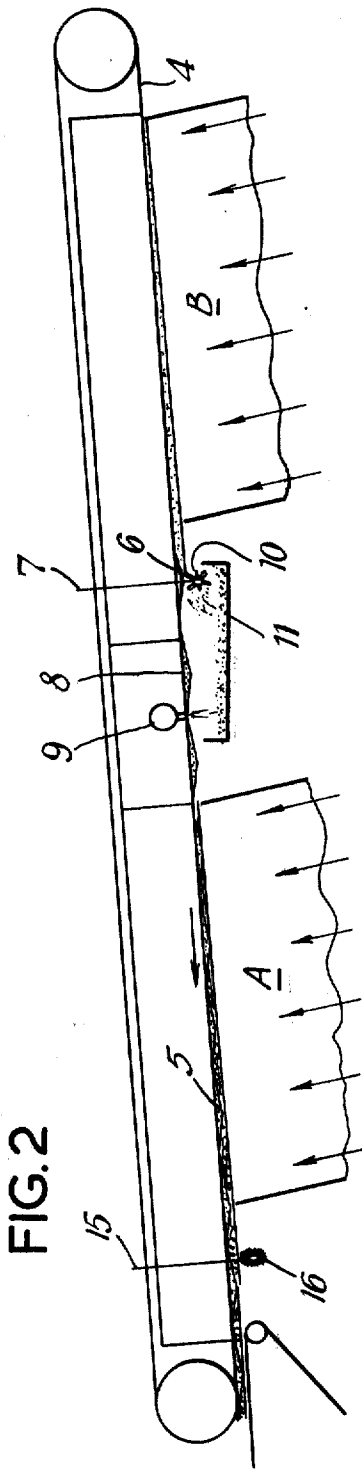
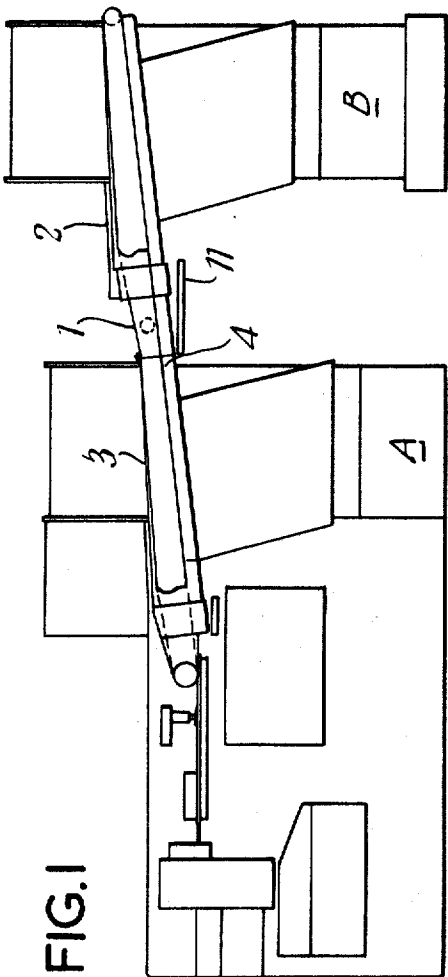
Primary Examiner—Joseph S. Reich
Attorney, Agent, or Firm—Finnegan Henderson Farabow & Garrett

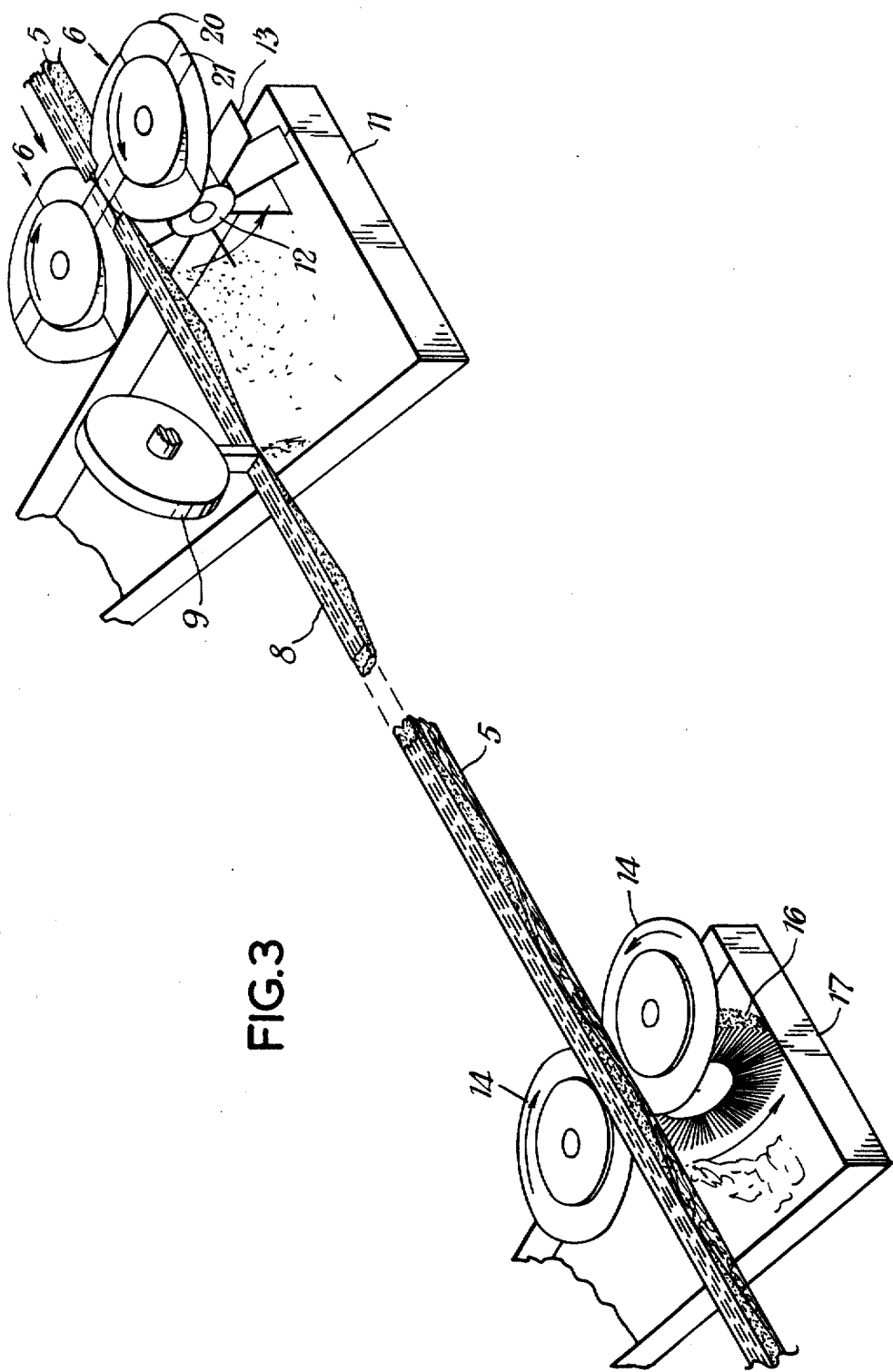
[57] **ABSTRACT**

A conventional "stratified" cigarette making machine provided with a tobacco feeding system to supply a smoking material of a selected type to the underside of an endless suction conveying band by means of which a generally uniform layer of said material is carried past trimming knives that cut the layer into a pre-determined double wedged profile that is then carried by the band to a second tobacco feeder on the machine that supplies the remainder of the smoking material, that is different from the first to provide a composite layer of material from which the cigarette is produced. The trimming knives comprise specially profiled cutting edges that produce the required profile.

7 Claims, 10 Drawing Figures







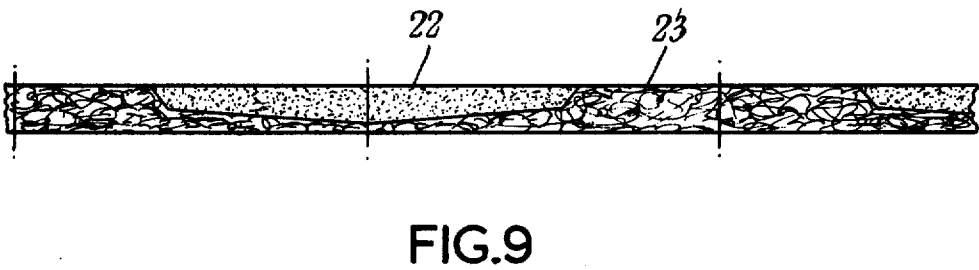
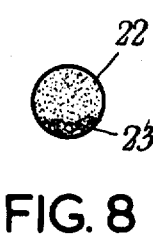
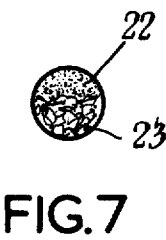
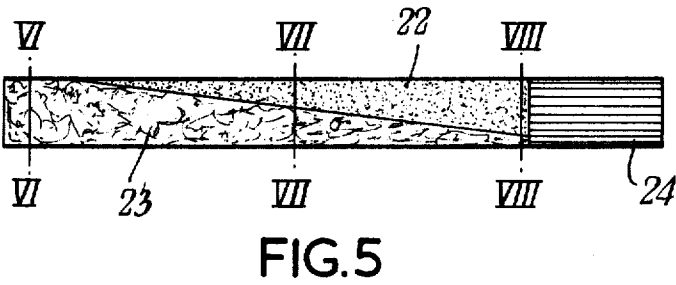
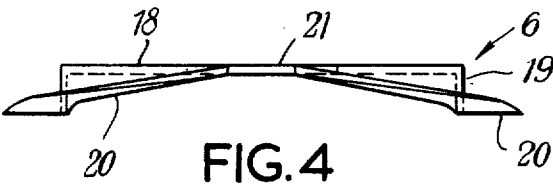
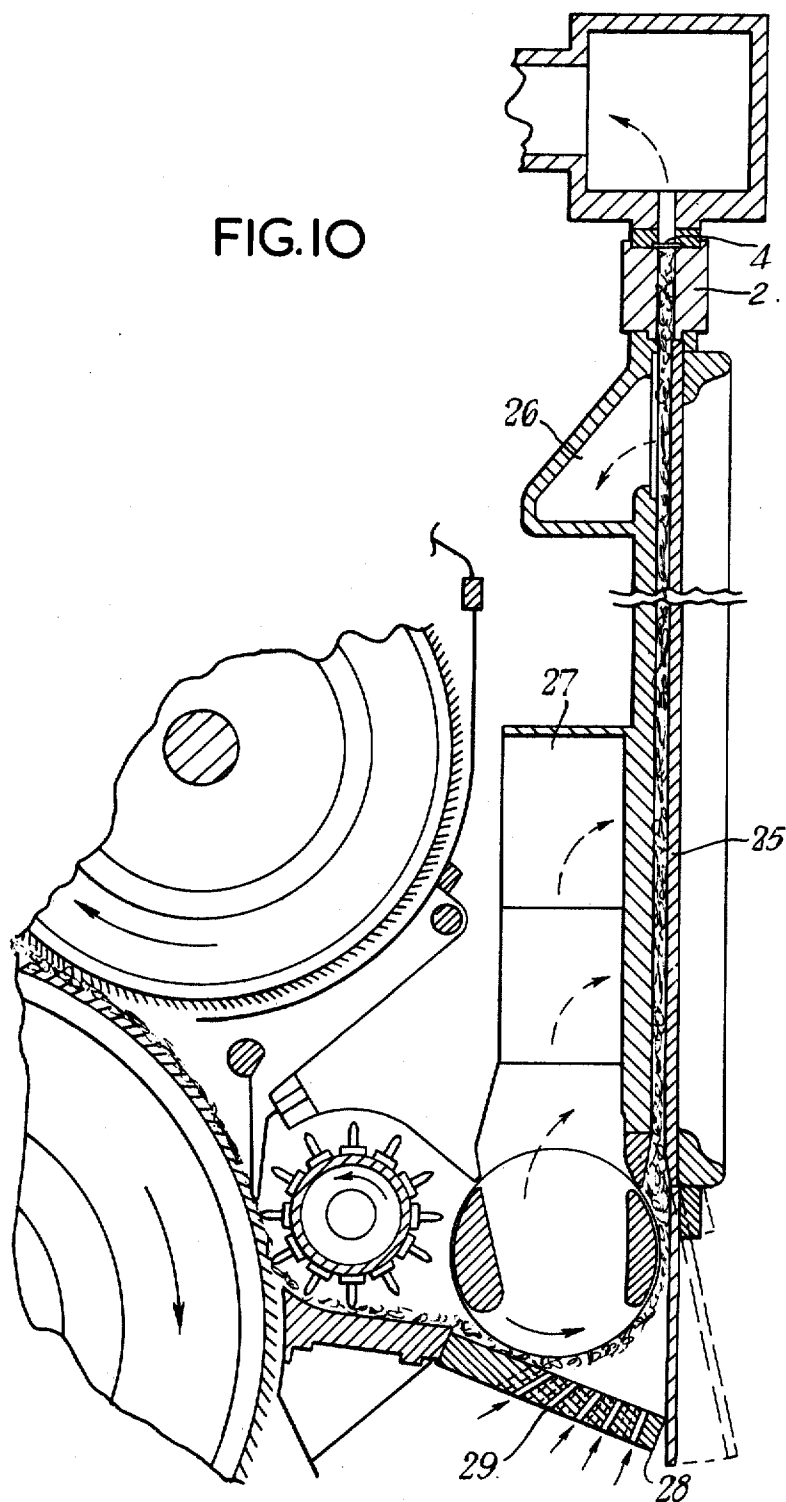


FIG. 10



PRODUCTION OF SMOKING ARTICLES

This invention concerns the production of smoking articles such as cigarettes. It is applicable, in particular, to the production of so-called "stratified" cigarettes composed of a type described in U.S. Pat. No. 3,759,367. A cigarette described in that patent comprises shredded natural tobacco and/or substitute tobacco, and a portion, of a different shredded natural tobacco, the two portions adjoining each other at a surface inclined in relation to the axis of the cigarette.

According to the invention, such a cigarette is produced on a cigarette making machine which is provided with an additional feed system and having shaping means together with means for pneumatic conveying of the smoking material during shaping, and also means for removing surplus material.

For example, these means may be added to a conventional cigarette making machine such as a molins type mark 8.

In one embodiment of the invention, an additional hopper holding smoking material represents one of the two portions of which the cigarette is to be composed, is fixed in cooperative relation to a suction band and in front or upstream of the conventional hopper system, and this hopper is provided with one large fan only for supplying the air for feeding the material onto the band. The fan is run at a higher speed than is normally used, for example, 4000 rpm. The additional hopper is positioned in line with the conventional hopper system in such a way that the smoking material, such as natural, reconstituted or substitute tobacco may be carried away from the chimney of both feed sections on a single, extended nylon suction band. This nylon suction band is about 6000 mm in length. The normal length of such a band is about 3285 mm. The smoking material fed from each hopper and conveyed on the nylon suction band is controlled by two ecreteur-shorts return units, one for each feed system. A standard ecreteur unit or trimming disc unit controls the weight of the cigarette as in normal practice.

An embodiment of the invention will now be described by way of example and with reference to the accompanying drawings in which:

FIG. 1 is a side elevation showing the additional feed system connected to a known cigarette making machine,

FIG. 2 is a schematic side view of the suction band showing the relative locations of the feed systems and trimming discs,

FIG. 3 is a diagrammatic perspective view of the two trimming disc assemblies and their associated parts,

FIG. 4 is a side view of a trimming disc from the additional or first feed system,

FIG. 5 is a longitudinal section of a cigarette produced in accordance with the invention,

FIGS. 6 to 8 are sections respectively on the lines VI—VI; VII—VII and VIII—VIII of FIG. 5,

FIG. 9 is a longitudinal section of a modified composite smoking mixture stream, and

FIG. 10 is a partial longitudinal section through a smoking mixture supply chimney by means of which the mixture is fed to the suction band.

As shown in FIG. 1 the cigarette making machine comprises a known type of machine having a feed system A to which is connected an additional feed system B. Each feed system provides a different type of smok-

ing mixture and it will be assumed that the system of machine A supplies natural tobacco and the system B supplies a synthetic smoking mixture or a mixture of natural and substitute tobacco.

The two parts of the machine A and B are connected by a casing 1 which together with casing part 2 and 3 define a suction housing for a suction band 4 which extends above both feed systems and carries the smoking mixture from which the cigarette is finally made. As shown in FIG. 2 the band 4 extends above feed systems A and B and the lower flight of the band travels in the indicated direction carrying the stream of smoking mixture by vacuum on its lower surface. As the band travels over feed system B it picks up a stream of smoking mixture in the form of a layer 5 which is carried past a set of trimming disc knives 6 rotating about their axes 7 on each side of the layer 5. The disc knives 6 cut the stream 5 laterally to the double-wedge shapes or configurations shown at 8 and after being cut the layer 5 passes a blow-off unit 9 which operates in a timed sequence to blow a narrow gap or separation between each double-wedge. The gap is, for example, 5 mm wide in the direction of travel. The discs 6 are provided with a cleaner disc 10 and a surplus material removed by the cleaner 10 and the blow-off unit 9 is collected in a tray 11. If desired this material can be re-cycled. As shown, the cleaner disc 10 consists of a central disc-like body 12 having a plurality of flexible blades 13 made, for example, of nylon (FIG. 3).

The band 4 carries the double-wedge shaped portions of the layer 5 over the feed system A from which the remainder of the smoking mixture is supplied, in this case, natural tobacco. The tobacco fills the gaps in the layer 5 and builds up a full depth layer that is planed to correct depth by a set of plain trimming cutter discs 14 rotating about the axes 15. A cleaning brush 16 is provided for the discs 14 and surplus material is collected in a tray 17 (FIG. 3). As FIG. 3 shows, the complete layer of smoking mixture is rectangular in section and for the sake of clarity the composition of the cigarette rods are illustrated in FIGS. 5 to 9 to be described below.

FIG. 4 shows one trimming cutter disc of the feed system B in side elevation, each disc being mounted on a fixed height yoke (not shown) by means of which the height of the material is controlled. Each disc 6 consists of a central body 18 which is substantially disc-shaped, and this body has a peripheral rim extending radially. The body 18 comprises a disc-like top with a side wall 19 extending at right angles thereto. Extending radially from the side wall is a flange which comprises four portions 20 inclined at an angle to the axis 7 about which the disc rotates and two portions 21 which are perpendicular to the axis of the disc. The portions 21 provide unshaped regions of the layer of smoking material 5 while the inclined portions 20 are so arranged that they cut the layer into the double-wedge portions before the layer is carried past the synchronously operating blow-off unit 9.

The layer of double-wedge shaped portions separated by the narrow gaps produced by the blow-off unit 9 passes over the feed system A which feeds the second type of smoking mixture upwardly in to the shaped layer and both fills the gap and builds up the layer to the desired depth which is determined by the trimming cutting discs 14.

The discs are provided with cleaning means in the form of a flapper-type brush consisting of a metal center disc into which are fitted flexible strips of nylon. Surplus material or shorts return are removed by means of a vibrating tray of large capacity which can handle returns of 50 percent and over and can be re-cycled if desired.

The geometry of the cigarette depends on the shape or geometry of the ecreteur discs.

As FIGS. 5 to 8 show, the trimming cutter discs 6 shown in FIGS. 3 and 4 produce the wedge-shaped portion 22 shown in FIGS. 5, 7 and 8, and it will be realised that the tapered portions 22 are produced by the disc 6 in oppositely inclined pairs, end to end. The cigarette shown in FIGS. 5 to 8 is made from one such portion and it can be seen from these figures how each end of the cigarette has at least some of the second smoking mixture 23. In this example the mouthpiece end of the cigarette comprises a filter 24 which adjoins a cigarette rod which is largely composed of the first smoking material fed from the feed system B but with a small portion of the second material, while the other end is entirely of the second type of material.

FIG. 9 is a longitudinal section of the completed layer in which the profile of the portions of the first type of material is varied by the use of a modified trimming cutter disc which by suitably shaping the inclined portions 20 gives each portion 22 the required shape.

The cigarettes are produced in pairs so that the cigarettes are presented in correct manner on both sides of a catcher band and/or a filter tip assembler. The cigarettes are made so that about the first 5 mm are composed entirely of one type of smoking material. On cutting the tobacco rod, the cut end will as a result be composed of only one type of smoking material. At the other end it is arranged such that there is always a small amount of tobacco present to avoid contamination of the additional feed hopper B with material from the conventional system A being obtained by means of dimensions and geometry of the two discs.

FIG. 10 illustrates, in longitudinal section, a form of feed chimney which is adapted to supply the first type of smoking material to the band 4 at the feed system B. This part of the cigarette making machine is largely conventional and feeds the smoking material from a picker roller into the air stream which is drawn up the chimney 25 to the underside of the band 4. Suction is applied through the housing 2 to draw the fibrous smoking mixture up to the band 4 as shown by the broken arrows. Further suction is also applied to the material in the chambers 26 and 27 to improve the transfer of material and the density of the stream before it reaches the band. The lower end of the chimney 25 is provided with a block 28 which has a plurality of jet air inlets 29 through which air is drawn into the lower part of the channel. The use of the block 28 having the air jets 29 aids entrainment of the smoking material into the upward air flow and by employing this particular construction the conventional winnowing or grading effect is avoided.

The air blow-off unit 9 is operated by means of a valve synchronised with the disc to blow off the small amount of material in the valleys of the profile, thus leaving the gap referred to above. The valve for the blow-off unit 9 may, for example, be a high-speed solenoid valve actuated by cams or microswitches, or it

may be a mechanical valve driven directly by the machine.

The shaped material is then conveyed on the band 4 above the chimney of the feed system A in the cigarette making machine. The smoking material, e.g., tobacco, is drawn up this chimney and deposited on the material already on the band 4. The rate of feed is such as to give sufficient tobacco to fill in the gaps in the layer and leave sufficient to overfeed to give reasonable cigarette weights. The layer formed by the composite feed of smoking material is then trimmed by the discs 14 in the normal manner and deposited on cigarette paper, wrapped and cut into individual cigarettes, the latter step being synchronised with the trimming cutter discs 14 on the feed system A. This is achieved preferably by running this system from the main drive shaft.

I claim:

1. In a cigarette making machine for producing a cigarette consisting partially of a first smoking tobacco material and partially of a second smoking tobacco material differing in composition from said first material, the improvement comprising:

- a. means for conveying tobacco, said means defining a tobacco receiving surface,
- b. means for supplying a first tobacco to said tobacco receiving surface for forming a generally uniform layer thereon,
- c. at least one trimming knife for trimming said tobacco to a generally double wedge configuration, having a central apex and generally feathering out in opposite directions therefrom, said knife operatively associated with said surface and being rotatable about an axis generally normal to the plane of said surface, said knife being comprised of cutting edge portions disposed in arcuate segments about said axis in alternately declining and inclining relation relative to the plane of said tobacco receiving surface,
- d. means for removing tobacco from between said double wedge configurations to provide separated portions therebetween,
- e. means for supplying a second tobacco to said layer for replacing at least in part, the trimmed away tobacco.

2. The improvement as recited in claim 1 wherein two trimming knives are provided in paired cooperative relation to simultaneously trim on opposite sides of said layer to effect a complete trimming of the layer to the double wedge configuration.

3. The improvement as recited in claim 1 wherein the conveyor means is comprised of a suction band.

4. The improvement as recited in claim 1 wherein at least one of the cutting edge portions of the trimming knife is parallel to the plane of said tobacco receiving surface and is positioned between said inclining and declining portions.

5. The improvement as recited in claim 1 wherein a cleaning means is provided adjacent said trimming knife for cleaning trimmed tobacco from said cutting edge portions, said cleaning means comprising a central disc having radially extending flexible blades.

6. The improvement as recited in claim 1 wherein the means for removing tobacco to provide a separation between configurations is comprised of a pneumatically operated blow-off means disposed between the first and second supply means and operated in a synchronized sequence to form gaps in the layer of smoking material.

5

6

ing material from said first supply means at predetermined intervals.

7. The improvement as recited in claim 1 wherein said first supply means includes means providing a suction chamber, said tobacco receiving surface being foraminous and arranged to be moved substantially horizontally below and adjacent to said chamber means, a

chimney arranged to feed said smoking tobacco material vertically upwardly to the underside of said tobacco receiving surface as it is moved over the upper end portion of said chimney, and the lower end portion of said chimney being provided with means forming a plurality of passages through which air may enter the same.

* * * * *

10

15

20

25

30

35

40

45

50

55

60

65