A cigarette making machine employs an endless foraminous belt one side of which advances a surplus-containing stream of comminuted smokable material toward, through and beyond a trimming station where a trimming device removes the surplus and the resulting rod-like filler is advanced past an instrument which monitors the density of the filler prior or subsequent to draping of such filler into a web of cigarette paper or the like. If the density of the filler departs from a desired density, a shoe-like guide member abutting the other side of the belt opposite the trimming device is moved toward or away from the trimming device and/or vice versa. The other side of the belt is adjacent a suction chamber, and the guide member has one or more openings through which the suction chamber attracts the running belt to an at least slightly convex side of the guide member.
METHOD OF AND APPARATUS FOR MAKING ROD-SHAPED SMOKERS' PRODUCTS HAVING PREDETERMINED DENSITIES

CROSS-REFERENCE TO RELATED CASES

[0001] This application claims the priority of commonly owned German patent application Serial No. 103 54 759.2-23 —DE filed Nov. 21, 2003.

[0002] The disclosure of the above-referenced German patent application, as well as the disclosures of all U.S. and foreign patents identified in the specification of the present application, are incorporated herein by reference.

BACKGROUND OF THE INVENTION

[0003] The invention relates to improvements in methods of and arrangements or apparatus for advancing streams of particles of smokable material, such as shredded tobacco leaf laminae. More particularly, the invention relates to improvements in methods and devices which can be utilized to guide streams of comminuted tobacco particles or the like in the regions of knives or analogous trimming or severing parts serving to remove surplus material from moving streams so that the thus trimmed streams form at least substantially rod-shaped fillers which are ready to be draped into running webs of cigarette paper or the like. The invention also relates to improvements in methods of and apparatus for selecting or correcting the density of a stream of smokable material and to improvements in machines, such as cigarette making machines, wherein the improved methods, apparatus and arrangements can be put to use.

[0004] Conventional machines, apparatus, arrangements and methods to which the present invention pertains are disclosed, for example, in commonly owned German patent No. 19846735 A1. As a rule, the so-called distributor of a cigarette making machine employs at least one endless foraminous belt or band conveyor which cooperates with a suction chamber to attract a shower or stream of comminuted tobacco leaves, fragments of substitute or reconstituted tobacco and/or other smokable material. The distributor further employs a roller which serves as a means for adjusting the weight and density of the stream. Such roller guides the foraminous belt conveyor at a variable distance from the often disc-shaped rotary knife or knives of the surplus removing trimming device. By causing or permitting the belt conveyor to move nearer to or further away from the trimming tool(s), the roller should permit for accurate (predictable) variations of density and hence of the weight of the trimmed stream (such trimmed stream is known as filler).

OBJECTS OF THE INVENTION

[0005] An important object of the present invention is to provide a novel and improved machine for making cigarettes or other rod-shaped smokers' products and wherein the weight and density of the trimmed stream of smokable material can be varied and selected with a higher degree of accuracy and in a manner simpler than that in presently known machines of such character.

[0006] Another object of the invention is to provide a novel and improved arrangement for removing the surplus from the advancing stream of comminuted smokable material in a cigarette making machine or the like.

[0007] A further object of the instant invention is to provide novel and improved means for guiding a stream of smokable material at the station where the stream is relieved of surplus material, particularly ahead of the station where the trimmed stream is draped into a running web of cigarette paper or the like.

[0008] An additional object of our invention is to provide tobacco stream guiding means which can be installed in presently known machines for making cigarettes or other rod-shaped smokers’ products.

[0009] Yet another object of the invention is to provide a novel and improved method of treating a fresh stream of smokable material in a machine for making cigarettes or the like.

[0010] An ancillary object of the invention is to provide a novel and improved method of regulating the weight and/or density of a stream of smokable material in a cigarette making machine or the like.

SUMMARY OF THE INVENTION

[0011] One of several features of the present invention resides in the provision of a method of manipulating a surplus-containing stream of comminuted smokable material at a trimming station. This method comprises the steps of advancing the stream lengthwise by one side of an elongated foraminous belt conveyor in a predetermined direction toward and through the trimming station, removing the surplus from the advancing stream at the trimming station, and supporting the other side of the belt conveyor during advancement at least through a major part of the trimming station.

[0012] The removing step can include employing at least one cutting implement at a location adjacent to and spaced apart from the conveyor at the trimming station, and the supporting step can include propping the other side of the conveyor at a selected distance from the at least one cutting implement.

[0013] The method can further comprise the step of varying the aforementioned distance to thus select the density of the stream advancing beyond the trimming station. Still further, the method can comprise the step of supporting the other side of the conveyor at least at one of two locations upstream and downstream of the trimming station (as seen in the determined direction).

[0014] Another feature of this invention resides in the provision of a method which can be resorted to in order to select the density of a surplus-containing stream of comminuted smokable material at a trimming station. This method comprises the steps of advancing the stream lengthwise in a predetermined direction toward and through the trimming station, propping successive portions of the stream at the trimming station, removing the surplus from the advancing propped stream portions at the trimming station, measuring the density of the trimmed stream downstream of the trimming station (as seen in the predetermined direction), comparing the measured density with a desired or optimum density, and altering the removing step when the measured density departs from the desired density.

[0015] The advancing step of the just discussed method can include advancing the stream at one side of and with a
driven foraminous belt conveyor, and the propping step can comprise supporting the other side of the belt conveyor during advancement at least through a major part of the trimming station. The removing step can include employing at least one cutting implement at a fixed location adjacent to and spaced apart from the conveyor at the trimming station, and the propping step can further comprise supporting the other side of the conveyor during advancement at least through the major part of the trimming station at a variable distance from the cutting implement. The altering step of such method can include varying the aforementioned distance when the measured density of the trimmed stream departs from the desired density.

A further feature of the present invention resides in the provision of an apparatus for manipulating a surplus-containing stream of comminuted smokable material at a trimming station. This apparatus comprises a foraminous belt conveyor which is arranged to advance in a predetermined direction and has one side arranged to attract and advance the stream lengthwise in the direction toward, through and beyond the trimming station and another side, means for removing the surplus from the advancing stream at the trimming station, and means for supporting the other side of the conveyor at least at the trimming station.

The removing means is or can be located at a first distance from the one side of the conveyor and the supporting means is then located at a variable distance from the removing means at the other side of the conveyor. Such apparatus can further comprise means for monitoring the density of the stream downstream of the trimming station (as seen in the predetermined direction), means for comparing the monitored density with a predetermined density, and means for varying the distance when the monitored density departs from the predetermined density. The supporting means can include a substantially block-shaped member which contacts the other side of the conveyor, and such block-shaped member can be provided with an at least substantially convex surface which contacts the other side of the conveyor. The block-shaped member can include at least one portion which extends beyond the trimming station in at least one of the directions upstream and downstream of the trimming station (as seen in the predetermined direction). In a presently preferred embodiment, the block-shaped member extends upstream and downstream of the trimming station.

The improved apparatus can further comprise a suction chamber which is adjacent the other side of the conveyor, and the supporting means can be provided with at least one opening which communicates with the suction chamber and extends to the other side of the conveyor so that the suction chamber can attract the conveyor to the supporting means.

Still another feature of the present invention resides in the provision of an apparatus for selecting the density of a stream of comminuted smokable material at a trimming or surplus removing station. This apparatus comprises an endless foraminous conveyor which is arranged to advance lengthwise in a predetermined direction and has a first side arranged to attract and advance a surplus-containing stream of smokable material toward and through the trimming station as well as a second side, means for removing the surplus from the stream at the first side of the conveyor at the trimming station, means for supporting the second side of the conveyor opposite the removing means (such supporting means is located at a variable distance from the removing means), means for monitoring the density of the stream downstream of the trimming station (as seen in the predetermined direction), and means for altering the distance when the monitored density of the stream departs from a predetermined density.

The altering means can be arranged to reduce the departure of monitored density from the predetermined density at least close to zero, and the supporting means can include a shoe having a substantially convex surface which contacts the second side of the conveyor. Such apparatus can further comprise a suction chamber which is adjacent the second side of the conveyor, and the aforementioned shoe can be provided with at least one opening which extends from the substantially convex surface and communicates with the suction chamber to attract the second side of the conveyor to the substantially convex surface of the shoe.

An additional feature of the present invention resides in the provision of a machine for making rod-shaped smokers’ products. The improved machine comprises an endless foraminous belt conveyor having a first side arranged to attract and to advance a continuous stream of surplus-containing smokable material lengthwise in a predetermined direction toward, through and beyond a trimming station and a second side, means for removing the surplus from the advancing stream at the trimming station and at the first side of the conveyor, means for supporting the second side of the conveyor opposite the surplus removing means (one of the, surplus removing means and the supporting means is movable toward and away from the other of these means), means for comparing the density of the advancing stream with a predetermined density downstream of the trimming station (as seen in the predetermined direction), and means for moving one of the supporting and removing means relative to the other of these means when the monitored density departs from the predetermined density.

The machine can further comprise means for drawing the stream into a web of cigarette paper or the like downstream of the trimming station to form a continuous cigarette rod or the like, and means for subdividing the continuous rod into plain cigarettes or other rod-shaped smokers’ products of n times unit length wherein n is a whole number including one.

The novel features which are considered as characteristic of the invention are set forth in particular in the appended claims. The improved apparatus and machine themselves, however, both as to their construction and the modes of operating the same, together with numerous additional important and advantageous features and attributes thereof and of the improved method, will be best understood upon perusal of the following detailed description of certain presently preferred specific embodiments with reference to the accompanying drawing.

**BRIEF DESCRIPTION OF THE DRAWING**

**FIG. 1** is a schematic elevational view of certain parts of a cigarette rod making machine including a tobacco stream guiding and trimming apparatus which embodies one form of the present invention; and
FIG. 2 is an enlarged view of a detail in the machine embodying the structure of FIG. 1.

DESCRIPTION OF PREFERRED EMBODIMENTS

FIG. 1 shows schematically the trimming or surplus removing station and the neighboring portions of a machine 1 for making rod-shaped smokers' products, e.g., cigarettes 2b of unit length or multiple unit length. A conventional machine of such character is shown, for example, in FIG. 7 of U.S. Pat. No. 4,281,670 granted Aug. 4, 1981 to Heitmann et al. for "APPARATUS FOR INCREASING THE PERMEABILITY OF WRAPPING MATERIAL FOR ROD-SHAPED SMOKERS' PRODUCTS" and in FIG. 3 of commonly owned U.S. Pat. No. 5,072,742 granted Dec. 17, 1991 to Heitmann for "METHOD OF AND APPARATUS FOR MAKING A FILLER OF SMOKABLE MATERIAL". The machine 1 comprises conventional means for producing a continuous surplus-containing stream 2 of comminuted (such as shredded) tobacco leaf laminae. The stream 2 is advanced lengthwise, in a direction indicated by an arrow F, by an endless foraminous belt or band conveyor 4 toward, through and beyond a severing, trimming or surplus removing station 6 where the surplus 22 is removed by a trimming or equalizing device 8 having at least one rotary disc-shaped knife 8a located at and spaced apart from the underside of the belt conveyor 4.

The machine 1 further comprises a novel shoe-like guide 10 having an at least slightly convex underside which contacts the upper side of the belt conveyor 4 opposite the trimming device 8 at the surplus removing or trimming station 6. FIG. 2 shows that the guide 10 has several openings 10d in the form of bores or holes each of which extends from the convex underside all the way to the flat upper side of the guide and thus communicates with a suction chamber 9 which serves to attract the stream 2 to the underside of the belt conveyor 4 as well as to attract successive increments of the upper side of the belt conveyor to the underside of the guide 10.

As can be seen in FIG. 2, the guide or shoe 10 includes an optional upstream portion or section 10a (as seen in the direction of the arrow F), an optional downstream portion or section 10b, and a median portion or section 10c opposite the trimming station 6. That surface of the shoe 6 which confronts and contacts the adjacent upper side of the belt conveyor 4 is preferably made of a ceramic or other highly wear-resistant material. It is also possible to employ a shoe at least the belt-contacting portion of which consists of a suitable hard metallic material.

FIG. 1 further shows a suitable reversible motor 12 which serves to move the shoe 10 up or down, depending upon the nature of signals furnished by the corresponding part of an electronic evaluating circuit 18 via conductor means 20. One input of the circuit 18 receives signals from a device 24 which monitors the density of the filler (i.e., of the trimmed tobacco stream 2) advancing beyond the trimming station 6. The signals from the monitoring device 24 determine the quantity of smokable material which the knife 8a of the trimming device 8 removes from the oncoming stream 2. To this end, the signals which are furnished by the device 24 via conductor means 26 are compared (in the evaluating circuit 18) with a signal which denotes the desired or optimal density of the trimmed stream 2, and the conductor 20 transmits to the motor 12 a signal to change the level of the shoe 10 when the monitored density departs from the desired or selected density.

For example, the density measuring device 24 can be of the type disclosed in commonly owned U.S. Pat. No. 4,805,641 granted Feb. 21, 1989 to Radzio et al. for "METHOD AND APPARATUS FOR ASCERTAINING THE DENSITY OF WRAPPED TOBACCO FILLERS AND THE LIKE".

A device 14 serves to monitor the position or level of the shoe 10 and transmits corresponding signals to the circuit 18 via conductor means 16 so that the circuit 18 interrupts the adjustment of the level of the shoe 10 when the latter reaches a position in which the monitored density of the trimmed tobacco stream matches the desired density.

The tobacco stream which is relieved of surplus tobacco 22 and which has advanced through and beyond the density measuring device 24 is caused to advance past a device 27 which monitors the speed of the advancing trimmed stream and transmits (via conductor means 28) appropriate signals to the aforementioned evaluating circuit 18.

The reference character 29 denotes in FIG. 1 a device which monitors discrete sections 2b (such as plain cigarettes of unit length or double unit length) of the wrapped stream 2 downstream of a standard cutoff (not shown) which is designed to subdivide the wrapped tobacco filler stream into discrete smokers' articles. Such articles can be advanced to storage, to a packing machine or to a filter cigarette making machine, e.g., a machine of the type disclosed in commonly owned U.S. Pat. No. 5,135,008 granted Aug. 4, 1992 to Oesterling et al. for "METHOD OF AND APPARATUS FOR MAKING FILTER CIGARETTES". A conductor 30 is provided to transmit signals from the monitoring device 29 to the corresponding input of the evaluating circuit 18.

The circuit 18 processes the signals which are transmitted thereto via conductors 16, 26, 28 and 30 and transmits (when necessary) appropriate signals to the motor 12 via conductor 20. This ensures that the distance between the knife 8a of the trimming device 8 and the shoe 10 is always best suited to ensure that the density of the fillers of discrete smokers' products matches or at least closely approximates a desired (optimum) density. As already mentioned hereinafore, the conductor 16 from the position monitoring device 14 ensures that the circuit 18 can always receive signals which denote the nominal (actual) distance of the shoe 10 from the knife 8a of the trimming device 8. It will be readily appreciated that the improved apparatus can be designed in such a way that, in lieu of or in addition to the movable shoe 10, it employs a knife 8a which is movable toward or away from the shoe.

FIG. 2 is a larger-scale view of that portion of the improved machine 1 which includes and is immediately adjacent the trimming device 8. The at least slightly convex shape of the underside of the shoe 10 shown in FIG. 2 reduces the extent of friction between such surface and the adjacent (upper) side of the illustrated (lower) reach or stretch of the endless foraminous belt 4. The character 32
denotes the axis of a shaft which is driven by a suitable motor (not shown) and serves to rotate the knife 8a of the trimming device 8. It is preferred to guide the illustrated reach 4x of the conveyor belt 4 and the trimmed stream 2 in such a way that it makes with the plane of the knife 8a an acute angle α. This ensures that the trimmed stream 2 cannot remain in frictional engagement with a large part of the upper side of the knife 8a. The removed surplus tobacco 22 can be returned into the distributor of the cigarette making machine 1.

[0036] The bores or holes 10d constitute optional but desirable features of the improved shoe 10; they ensure that the suction chamber 9 can attract successive increments of the lower reach 4x of the advancing belt conveyor 4 to the convex underside of the shoe and also that the tobacco stream portions at the trimming station 6 tend to adhere to the underside of the lower reach 4x of the conveyor. Still further, the bores or holes 10d contribute to cooling of the shoe 10.

[0037] An important advantage of the improved guide shoe 10 over the conventional rollers (such as that disclosed in the aforementioned German patent No. 19846735 A1) is that this shoe is or can be located at the trimming station 6. As a rule, the roller or rollers of conventional cigarette making machines are installed at a distance of approximately 30 mm upstream (i.e., ahead) of the shaft or shafts of the rotary cutter(s) at the trimming station. This is to ensure that the foraminous conveyor for the advancing tobacco stream reaches a desired position relative to the surplus removing device ahead of the trimming station. Consequently, in such conventional apparatus, that stretch of the foraminous belt which is located between the roller and the shaft of the rotary cutter of the trimming device or between the mutually adjacent marginal portions of two rotary trimming knives remains unsupported. This renders it possible that the position of the foraminous belt is affected by suction in the suction chamber, by the tension of the belt and/or by the speed of the rod making machine. In other words, the level as well as the lateral position of that portion of the tobacco stream which advances through the trimming or surplus removing station can be influenced by any one of several factors which evidently affects the reliability with which the conventional machines select the weight and the density of the rod-like fillers of the ultimate products.

[0038] All of the above-mentioned drawbacks of conventional machines and tobacco stream guiding apparatus are avoided with the advent of the present invention in that the foraminous conveyor belt and the tobacco stream portion adhering thereto are adequately supported at the critical location, namely at least at the trimming station or at least at a substantial part of the trimming station. This is accomplished by the novel expedient of properly selecting the configuration, the location and the dimensions of the improved shoe 10 or an equivalent thereof. In accordance with a presently preferred embodiment of the invention, the dimensions of the shoe 10 are selected in such a way that the shoe adequately props those successive portions of the conveyor belt 4 which carry the tobacco stream portions contacting the cutter (8a) or cutters of the trimming device 8, or which carry the tobacco stream portions from the region of initial contact with the knife or knives 8a to the locus where the surplus 22 is separated from the remaining portion (filler) of the (trimmed) tobacco stream 2. Such mode of operation of the improved apparatus and of the improved machine 1 has been found to result in the making of a trimmed stream (filler) having optimum dimensions and density for the making of superior smokers’ products (such as the cigarettes 2b).

[0039] As a rule, the conveyor belt 4 is tensioned in such a way (and the subatmospheric pressure in the suction chamber 9 is such) that the belt portions at the trimming station 6 invariably contact the entire underside of the shoe 10. This is also an important prerequisite for the making of an optimal trimmed stream and for the achievement of optimal density and dimensions of the rod-like fillers of the smokers’ products 2b. The feature that the convex underside of the shoe 10 causes the adjacent portion of the advancing stream 2 to assume a complementary shape also contributes to the aforementioned advantages of the ultimate products because successive tobacco stream portions arriving at the trimming station 6 are even more likely to follow the outline of the underside of the novel shoe 10.

[0040] Another important advantage of the improved method, apparatus and machine 1 is that the quality of the ultimate products (such as the cigarettes 2b of double unit length or the products obtained as a result of processing of smokers’ products 2b into filter cigarettes or the like, e.g., in a machine of the type disclosed in the aforementioned commonly owned U.S. Pat. No. 5,135,808 to Oesterling et al.) is not influenced by numerous extraneous parameters such as the speed of the machine, the tension of the conveyor band 4, the nature of the conveyor band, the pressure in the suction chamber 9 and/or other parameters; signals denoting such parameters are or can be transmitted to the evaluating circuit 18 which (if necessary) selects the intensity and/or other characteristics of signals being transmitted by the conductor means 20 (i.e., the level of the shoe 20) accordingly.

[0041] Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can, by applying current knowledge, readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic and specific aspects of the above outlined contribution to the art of making cigarettes or analogous rod-shaped smokers’ products and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the appended claims.

What is claimed is:

1. A method of manipulating a surplus-containing stream of comminuted smokable material at a trimming station, comprising the steps of:

   advancing the stream lengthwise by one side of an elongated foraminous belt conveyor in a predetermined direction toward and through said trimming station;

   removing the surplus from the advancing stream at said trimming station; and

   supporting the other side of the belt conveyor during advancement at least through a major part of said trimming station.

2. The method of claim 1, wherein said removing step includes employing at least one cutting implement at a location adjacent to and spaced from the conveyor at said trimming station.
station, said supporting step including propping the other side of the conveyor at selected distance from said at least one cutting implement.

3. The method of claim 2, further comprising the step of varying said distance to thus select the density of the stream advancing beyond said trimming station.

4. The method of claim 1, further comprising the step of supporting the other side of the conveyor at least one of two locations upstream and downstream of said trimming station as seen in said predetermined direction.

5. A method of selecting the density of a surplus-containing stream of comminuted smokable material at a trimming station, comprising the steps of:

   advancing the stream lengthwise in a predetermined direction toward and through said trimming station;

   removing the surplus from the advancing stream at said station;

   measuring the density of the trimmed stream downstream of said station, as seen in said direction;

   comparing the measured density with a desired density; and

   altering said removing step when the measured density departs from the desired density.

6. The method of claim 5, wherein said advancing step includes advancing the stream at one side of and with an advancing foraminous belt conveyor, and further comprising the step of supporting the other side of the belt conveyor during advancement at least through said station, said removing step including employing at least one cutting implement at a fixed location adjacent to and spaced apart from the conveyor at said station and said propping step further comprising supporting the other side of the conveyor during advancement at least through said major part of said station at a variable distance from the cutting implement, said altering step including varying said distance when the measured density of the trimmed stream departs from the desired density.

9. Apparatus for manipulating a surplus-containing stream of comminuted smokable material at a trimming station, comprising:

   a foraminous belt conveyor arranged to advance in a predetermined direction and having one side arranged to attract and advance the stream lengthwise in said direction toward, through and beyond said station and another side;

   means for removing the surplus from the stream at said station; and

   means for supporting the other side of said conveyor at least at said station.

10. The apparatus of claim 9, wherein said removing means is located at a first distance from said one side of said conveyor and said supporting means is located at a variable distance from said removing means at said other side of said conveyor.

11. The apparatus of claim 10, further comprising means for monitoring the density of the stream downstream of said trimming station, as seen in said direction, means for comparing the monitored density with a predetermined density, and means for varying said distance when the monitored density departs from said predetermined density.

12. The apparatus of claim 11, wherein said supporting means includes a substantially block-shaped member contacting said other side of said conveyor.

13. The apparatus of claim 12, wherein said block-shaped member has a substantially convex surface contacting said other side of said conveyor.

14. The apparatus of claim 12, wherein said member has at least one portion extending beyond said station in at least one of the directions upstream and downstream of said station, as seen in said predetermined direction.

15. The apparatus of claim 12, wherein said member extends upstream and downstream of said station, as seen in said predetermined direction.

16. The apparatus of claim 9, further comprising a suction chamber adjacent said other side of said conveyor, said supporting means having at least one opening communicating with said suction chamber and extending to said other side of said conveyor so that said suction chamber can attract said conveyor to said supporting means.

17. Apparatus for selecting the density of a stream of comminuted smokable material at a trimming station, comprising:

   an endless foraminous conveyor arranged to advance lengthwise in a predetermined direction and having a first side arranged to attract and advance a surplus-containing stream of smokable material toward and through said trimming station and a second side;

   means for removing the surplus from the stream at said first side of said conveyor at said trimming station;

   means for supporting the second side of said conveyor opposite said removing means, said supporting means being located at a variable distance from said removing means;
means for monitoring the density of the stream downstream of said station, as seen in said direction; and
means for altering said distance when the monitored density of the stream departs from a predetermined density.

18. The apparatus of claim 17, wherein said altering means is arranged to reduce the departure of monitored density from said predetermined density at least close to zero.

19. The apparatus of claim 17, wherein said supporting means includes a shoe having a substantially convex surface contacting said second side of said conveyor.

20. The apparatus of claim 19, further comprising a suction chamber adjacent said second side of said conveyor, said shoe having at least one opening extending from said substantially convex surface and communicating with said suction chamber to attract the second side of said conveyor to said substantially convex surface of said shoe.

21. A machine for making rod-shaped smokable products, comprising:
an endless foraminous belt conveyor having a first side arranged to attract and to advance a continuous stream of surplus-containing smokable material lengthwise in a predetermined direction toward, through and beyond a trimming station and a second side;
means for removing the surplus from the advancing stream at said trimming station and at said first side of said conveyor;
means for supporting the second side of the conveyor opposite said surplus removing means, one of said removing means and said supporting means being movable toward and away from the other thereof;
means for comparing the density of the advancing stream with a predetermined density downstream of said station, as seen in said direction; and
means for moving one of said supporting and removing means relative to the other thereof when the monitored density departs from said predetermined density.

22. The machine of claim 21, further comprising means for draping the stream into a web of cigarette paper downstream of said station to form a continuous cigarette rod, and means for subdividing the continuous rod into plain cigarettes of n times unit length wherein n is a whole number including one.

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