

Firmness improvement in cigarette rod

This invention relates to the manufacture of cigarette rod and more particularly to an apparatus and method for improving the firmness of cigarette rod during the manufacture thereof.

In the manufacture of cigarette rod, complex machinery is necessary, as the manufacturing occurs at high speed. In the filling or wrapping step, tobacco is fed into a wrapper at relatively high speed forming a cigarette rod which is subsequently cut, also at high speed, into preselected sizes. In this processing or manufacturing stage, there is generally a tendency for the tobacco strands to become axially aligned within the cigarette rod. Because of this alignment, low void volumes occur and the firmness of the cigarette product is relatively low. Also, because the tobacco is not perfectly aligned, the final product has an uneven density or fill value of tobacco within the cigarettes and voids are found therein.

It is therefore desirable to provide an apparatus and method for improving the firmness of a cigarette rod during manufacture.

The invention seeks to provide a practical straightforward apparatus for improving the firmness of cigarette rod by the use of high-energy gas, during the manufacture of the rod, for reorienting the tobacco in the rod. The

invention further seeks to provide a method for improving the firmness of a cigarette rod during manufacture, utilizing high-energy gas.

According to the invention, an apparatus for improving the firmness of cigarette rod comprises a housing having spaced aligned inlet and outlet openings to receive a cigarette rod therethrough, guide means between the inlet and outlet openings to guide the cigarette rod through the housing and a gas opening in the housing in flow communication with a gas supply source and means for maintaining a gas pressure of at least 350 g per cm^2 in said housing.

Also, according to the invention, a method for improving the firmness of cigarettes comprises the steps of passing a cigarette rod through a firmness treating zone and treating the cigarette rod in the zone with high-energy gas at a pressure of at least 350 g per cm^2 to reorient tobacco particles within said rod while said rod is passing through said zone at a predetermined velocity.

A preferred embodiment of the invention by way of example will now be more fully described with reference to the accompanying drawing in which the single Figure is a perspective view, with selected portions cut away, of an apparatus for improving the firmness of a cigarette rod.

In the Figure, a housing 2 for receiving a formed cigarette rod therethrough is provided with a cigarette-

rod inlet 4 and a cigarette-rod outlet 6, inlet 4 and outlet 6 being in spaced alignment. The housing 2 is disposed between a garniture and a cutter of a cigarette making machine (not shown).

5 An outwardly extending guide member 10 having a centrally disposed opening therethrough is attached to the housing 2, circumscribing and in axial alignment with the inlet 4. The guide member 10 receives the cigarette rod 8 therethrough, guiding the rod into the
10 housing 2. Disposed within the housing 2 is an interior guide member 12 of upwardly open channel-shaped cross-section, the channel of the member 12 being in alignment with the opening in the exterior guide member 10 for receiving the cigarette rod 8 therefrom.

15 The housing 2 is also provided with a gas inlet opening 14 which receives a conduit member 16 in flow communication with a gas supply source (not shown) for delivering gas, usually air, at a preselected velocity. In the example, the velocity is determined by an inlet
20 opening of about 0.31 cm diameter and a pressure of between about 350 and 2800 g per cm². With other inlet opening sizes, the pressure of the gas can be altered accordingly to maintain sufficient energy for dis-orienting the tobacco strands. For example, for larger
25 inlet openings, the gas pressure can be less and conversely for smaller inlet openings.

A plurality of substantially small apertures 18 are provided in the housing 2 to vent, or allow the escape of, gas from the housing 2. However, although it is preferred to have small apertures 18 therein, these apertures are not essential.

In the operation of the apparatus of this embodiment, a cigarette rod 8 is passed through the housing 2 at relatively high speed, generally between 60 and 450 m per minute, and gas is introduced through conduit 16, at a pressure of 350 to 2800 g per cm² at a 0.31 cm diameter inlet opening. This high-energy gas supply is sufficient to set up vibrations within the rod, thereby reorienting the previously aligned tobacco. The firmness of the final product, a cigarette, is thereby improved. If desired, the gas may be so supplied as to produce high-energy gas waves.

In a preferred embodiment, the housing dimensions will generally be about 3.8 cm by 4.4 cm by 90 cm. Inserted between the garniture and cutting head of a cigarette maker, such a housing will allow sufficient dwell-time immediately after rod formation, during the tobacco relaxation period, to reorient the previously aligned tobacco particles.



C L A I M S

1. An apparatus for improving the firmness of cigarette rods, comprising a housing having spaced aligned inlet and outlet openings to receive a cigarette rod therethrough,
5 guide means between said inlet and outlet openings to guide a cigarette rod through said housing, a gas supply opening in the housing in flow communication with a gas supply source and means for maintaining a gas pressure of at least 350 g per cm² in said housing, while said rod is
10 travelling through said housing at a predetermined velocity so as to reorient tobacco particles in said rod.
2. The apparatus of claim 1 including a plurality of gas escape apertures in said housing to vent gas from the apparatus.
- 11 3. The apparatus of claim 1 or 2, wherein said guide means includes an exterior outwardly extending guide member with a centrally disposed opening therethrough in alignment with said inlet opening, and an interior guide member of channel-shaped cross section, the channel being in alignment with
20 said outwardly extending guide member.
4. The apparatus of claim 1, 2 or 3, wherein said gas is air.
5. An apparatus for improving the firmness of cigarette rods substantially as hereinbefore described with reference
25 to the accompanying drawing.

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6. A method for improving the firmness of cigarettes, comprising the steps of passing cigarette rod through a firmness treating zone and treating the cigarette rod in said zone with a gas at a pressure of at least 350 g per cm².to reorient tobacco particles within said rod while said rod is passing through said zone at a predetermined velocity.
7. The method of claim 6, wherein the cigarette rod is travelling at a rate of 60 to 450 m per minute.
- 10 8. The method of claim 6 or 7, wherein the gas pressure is from about 350 to 2800 g per cm² with an inlet opening of about 0.31 cm.in diameter for the gas supply to the treating zone.
9. A method for improving the firmness of cigarettes
- 15 substantially as hereinbefore described.

The text of the specification has been reproduced by photocopying the applicants original typescript. It may contain a few amendments which are difficult to read. The original typescript containing these amendments may be inspected on the premises of the Patent Office

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