shreds of tobacco material from the ends of the rod. This is exacerbated by breakage of the shreds of tobacco material during rod formation. Loose ends are not only aesthetically undesirable, but can also disadvantageously lead to the need for more frequent cleaning of manufacturing equipment and smoking devices.

Thirdly, rods comprising shreds of tobacco material exhibit high weight standard deviations, that is rods of the same dimensions tend to be of inconsistent weight. This is due in part to the tendency of the rods to exhibit loose ends as mentioned above. The high weight standard deviation of rods comprising shreds of tobacco material leads to an undesirably high rejection rate of rods whose weight falls outside of a selected acceptance range.

Finally, rods comprising shreds of tobacco material exhibit non-uniform densities, that is, the density along the length of the rod tends to be inconsistent. This is due to variations in the quantity of tobacco material at different locations along the rod, which results in 'voids', that is reduced quantities of tobacco material, and 'pads', that is increased levels of tobacco material. The non-uniform density of rods comprising shreds of tobacco material can undesirably affect the resistance to draw (RTD) of the rods. In addition, the non-uniform density of rods comprising shreds of tobacco material can lead to loose ends when a void is located at the end of the rod.

Loose ends, high weight standard deviations and non-uniform densities as exhibited by rods comprising shreds of tobacco material are particularly problematic and undesirable in rods of short length. Rods of short length are sometimes referred to as plugs.

It would be desirable to provide rods comprising tobacco material for use in smoking articles that exhibit fewer loose ends than rods comprising shreds of tobacco material.

Alternatively or in addition, it would be desirable to provide rods comprising tobacco material for use in smoking articles that exhibit lower weight standard deviations than rods comprising shreds of tobacco material.

Alternatively or in addition, it would be desirable to provide rods comprising tobacco material for use in smoking articles that exhibit more uniform densities than rods comprising shreds of tobacco material.

There is provided a rod comprising a gathered sheet of homogenised tobacco material comprising one or more aerosol-formers circumscribed by a wrapper, wherein the sheet of homogenised tobacco material has an aerosol former content of greater than 5% on a dry weight basis.

There is further provided a rod comprising a gathered sheet of homogenised tobacco material comprising one or more aerosol-formers circumscribed by a wrapper, wherein the sheet of homogenised tobacco material has an aerosol former content of between 5% and 30% by weight on a dry weight basis.

There is further provided a rod comprising a gathered sheet of homogenised tobacco material circumscribed by a wrapper and a continuous element to which one

or more additives have been applied, wherein the continuous element is incorporated into the gathered continuous sheet of homogenised tobacco material.

According to the invention, there is further provided a heated smoking article comprising an aerosol-generating substrate, wherein the aerosol-generating substrate comprises a rod comprising a gathered sheet of homogenised tobacco material circumscribed by a wrapper and the sheet of homogenised tobacco material is crimped.

As used herein, the term ‘rod’ is used to denote a generally cylindrical element of substantially circular, oval or elliptical cross-section.

As used herein, the term ‘sheet’ denotes a laminar element having a width and length substantially greater than the thickness thereof.

As used herein, the term ‘length’ denotes the dimension in the direction of the cylindrical axis of rods according to the invention.

As used herein, the term ‘width’ denotes a dimension in a direction substantially perpendicular to the cylindrical axis of rods according to the invention.

As used herein, the term ‘homogenised tobacco material’ denotes a material formed by agglomerating particulate tobacco.

As used herein, the term ‘gathered’ denotes that the sheet of homogenised tobacco material is convoluted, folded, or otherwise compressed or constricted substantially transversely to the cylindrical axis of the rod.

As used herein, the expression ‘rods according to the invention’ also refers to rods in heated smoking articles according to the invention.

It will be appreciated that in the following description of the invention features described in relation to one embodiment of the invention may also be applicable to other embodiments of the invention.

The gathered sheet of homogenised tobacco material preferably extends along substantially the entire length of the rod and across substantially the entire transverse cross-sectional area of the rod.

The inclusion of a gathered sheet of homogenised tobacco material in rods according to the invention advantageously significantly reduces the risk of loose ends compared to rods comprising shreds of tobacco material.

Rods comprising a sheet of homogenised tobacco material according to the invention advantageously exhibit significantly lower weight standard deviations than rods comprising shreds of tobacco material. The weight of a rod according to the invention of a particular length is determined by the density, width and thickness of the sheet of homogenised tobacco material that is gathered to form the rod. The weight of rods according to the invention of a particular length can thus be regulated by controlling the density and dimensions of the sheet of homogenised tobacco material. This reduces inconsistencies in weight between rods according to the invention of the same dimensions, and so results in lower rejection rate of rods whose weight falls outside of a selected

sheet of homogenised tobacco material; rod forming means for gathering the continuous crimped sheet of homogenised tobacco material and circumscribing the gathered continuous crimped sheet of homogenised tobacco material with a wrapper to form a continuous rod; and cutting means for severing the continuous rod into a plurality of discrete rods. The apparatus also comprises transport means for transporting the continuous sheet of homogenised tobacco material downstream through the apparatus from the supply means to the rod forming means via the crimping means.

As shown in Figure 1, the supply means comprises a continuous sheet of homogenised tobacco material 2 mounted on a bobbin 4 and the crimping means comprises a pair of rotatable crimping rollers 6. In use, the continuous sheet of homogenised tobacco material 2 is drawn from the bobbin 4 and transported downstream to the pair of crimping rollers 6 by the transport mechanism via a series of guide and tensioning rollers. As the continuous sheet of homogenised tobacco material 2 is fed between the pair of crimping rollers 6, the crimping rollers engage and crimp the continuous sheet of homogenised tobacco material 2 to form a continuous crimped sheet of homogenised tobacco material 8 having a plurality of spaced-apart ridges or corrugations substantially parallel to the longitudinal axis of the sheet of homogenised tobacco material through the apparatus.

The continuous crimped sheet of homogenised tobacco material 8 is transported downstream from the pair of crimping rollers 6 to the rod forming means by the transport mechanism where it is fed through a converging funnel or horn 10. The converging funnel 10 gathers the continuous crimped sheet of homogenised tobacco material 8 transversely relative to the longitudinal axis of the sheet of homogenised tobacco material. The continuous crimped sheet of homogenised tobacco material 8 assumes a substantially cylindrical configuration as it passes through the converging funnel 10.

Upon exiting the converging funnel 10, the gathered continuous crimped sheet of homogenised tobacco material is wrapped in a continuous sheet of wrapping material 12. The continuous sheet of wrapping material is fed from a bobbin 14 and enveloped around the gathered continuous crimped sheet of homogenised tobacco material by an endless belt conveyor or garniture. As shown in Figure 1, the rod forming means comprises an adhesive application means 16 that applies adhesive to one of the longitudinal edges of the continuous sheet of wrapping material, so that when the opposed longitudinal edges of the continuous sheet of wrapping material are brought into contact they adhere to one other to form a continuous rod.

The rod forming means further comprises a drying means 18 downstream of the adhesive application means 16, which in use dries the adhesive applied to the seam of the continuous rod as the continuous rod is transported downstream from the rod forming means to the cutting means.

The cutting means comprises a rotary cutter 20 that severs the continuous rod into a plurality of discrete rods of unit length or multiple unit length.

The apparatus shown in Figure 1 further comprises an additive application means 24 located between the crimping means and the rod forming means for applying solid or liquid additives such