Multi-segment smoking article

The present invention relates to a smoking article with at least two segments of smokable material and further to a method for producing such a multi-segmented smoking article.

Filter cigarettes typically comprise a filter aligned in an end-to-end relationship with a wrapped tobacco rod, with the filter attached to the tobacco rod by tipping paper. The tobacco rod usually comprises a single segment of tobacco which includes a blend of tobaccos. However, it is also known to combine several segments of tobacco together to form the tobacco rod. For example, a tobacco rod has been disclosed that is made from two segments of tobacco where one segment has higher quality tobacco blend than the other segment as a cost saving measure. In addition, it has been disclosed to produce a tobacco rod with segments having different densities or diameters in order to provide a uniform nicotine delivery as the tobacco rod is smoked.

~~It is the object~~Embodiments of the present invention ~~to~~ provide a smoking article, and a method for producing a smoking article, wherein one or more smoke constituents are reduced while maintaining desired sensorial attributes and blend characteristics as the smoking article is smoked by the consumer.

~~According to the present invention there is provided a smoking article comprising a rod of smokable material with a mouth end and a distal end remote from the mouth end, the rod comprising at least a first segment and a second segment, wherein the first segment has a distal end defining the distal end of the rod and the second segment is disposed downstream of the first segment. The smoking article also comprises a mouthpiece, which is attached to the mouth end of the rod. The first segment comprises a first tobacco blend with a first level of one or more endogenous smoke constituents and the second segment comprises a second tobacco blend with a second level of one or more endogenous smoke constituents, wherein the second level is lower than the first level.~~

According to a first aspect of this present invention, there is provided a smoking article comprising: a rod of smokable material with a mouth end and a distal end remote from the mouth end, the rod comprising at least a first and a second segment, wherein the first segment has a distal end defining the distal end of the rod and the second segment is disposed downstream of the first segment, and a mouthpiece, which is attached to the mouth end of the rod, wherein the first segment comprises a first tobacco blend with a first level of an endogenous smoke constituent and the second segment comprises a second tobacco blend with a second level of the endogenous smoke constituent, wherein the

second level of the endogenous smoke constituent is lower than the first level, and wherein the first tobacco blend includes a higher level of a smoke constituent inhibitor such as ammonia or an amino acid than the second tobacco blend, wherein at least 30% by weight of the lamina material in the first segment is air cured burley tobacco.

"Endogenous smoke constituents" are defined in this application as constituents of the smoke produced from the burning of tobacco that are present in the tobacco before it is burned. "Downstream" and "upstream" are defined in relation to the direction of smoke traveling through the smoking article. In other words, a downstream segment would be relatively closer to the mouth of the consumer than an upstream segment.

In a preferred embodiment, the one or more endogenous smoke constituents includes TSNA (Tobacco Specific Nitrosamine). Most of the TSNAs are found in tobacco products and are

about 1500 nanograms of TSNA per gram of the tobacco blend, more preferably less than about 1200 nanograms, and most preferably less than about 1000 nanograms. The amount of TSNA present in the blend of the second segment is preferably at least about 25% lower than the amount of TSNA in the blend of the first segment, more preferably at least about 40% lower, and most preferably at least about 60% lower.

As mentioned above, the length of each tobacco segment may be varied in order to balance the amount of taste delivered by the first segment relative to the taste delivered by the second segment and at the same time reduce the amount of the one or more endogenous smoke constituents that are delivered. In a preferred embodiment, the first segment comprises a length which is greater than 25% of the length of the tobacco rod. More preferably, the length of the first segment is greater than 40%, or most preferably greater than 60% of the length of the tobacco rod. In some embodiments, the length of the first segment may be between about 25% and about 75%, from about 25% to about 60%, or from about 40 to about 60%, of the length of the tobacco rod. In view of the previously described carry-over effect, the specific sensorial characteristics from the first blend are deposited in the second blend during smoking, so that the characteristics of the first blend may be at least partially experienced when the second blend is smoked.

Consequently, according to embodiments of the present invention, by increasing the length of one segment compared to the other segment, it is possible to achieve a dominant flavor typical for the relatively larger segment.

In another preferred embodiment of the invention the mouthpiece of the smoking article comprises at least one filter element. The filter element can be attached to a mouth end of the second segment of the rod. Preferably, the filter section is a multi-component filter and may contain one or more components having different filtering properties and characteristics.

In some embodiments, the first and second segment abut one another so that there is no space between the first segment and the second segment.

In addition, the tobacco rod may further comprise a third tobacco segment. The first segment and second segment may comprise any of the tobacco blends described above, and the third segment may comprise a third tobacco blend. In a preferred embodiment, the first tobacco blend is an American blend, the second tobacco blend is a Virginia blend and the third tobacco blend is an American blend that is different than the blend of the first segment. The third tobacco segment is preferably disposed between the first tobacco segment and second tobacco

segment, downstream of the first tobacco segment and upstream of the second tobacco segment. The addition of a third segment may allow for a more gradual transition between the tobaccos of the first, second and third segments. The first segment may comprise a first tobacco blend with a preferred taste. The second tobacco blend may comprise a tobacco blend that is less preferred from a taste standpoint, but has a lower level of one or more endogenous smoke constituents. The third blend may have some taste characteristics of the first blend in order to provide a more consistent taste throughout the smoking of the tobacco rod. In some embodiments, the third blend may also have a level of the one or more endogenous smoke constituents that is between the level of the one or more endogenous smoke constituents of the first blend and second blend. In preferred embodiments, the one or more endogenous smoke constituents includes TSNA. In addition, the tobacco rod may also have more than one tobacco segment between the first segment and second segment in order to further smooth the transition in taste between the first segment and second segment.

~~The present invention also relates to a method for producing a multi-segmented smoking article with a rod of smokable material as described above. The method according to the invention comprises supplying a first blend and a second blend of smoking material, wherein the first blend comprises a first level of one or more endogenous smoke constituents, and the second blend comprises a second level of the one or more endogenous smoke constituents.~~

According to a second aspect of the present invention, there is a method for producing a multi-segmented tobacco rod of smokable material, the method comprises: supplying a wrapper material, supplying at least a first and a second blend of smokable material, wherein the first blend comprises a first level of a endogenous smoke constituent, and the second blend comprises a second level of the endogenous smoke constituent, wherein the second blend comprises a lower amount of the endogenous smoke constituent than the first blend, wherein the first tobacco blend includes a higher level of a smoke constituent inhibitor such as ammonia or an amino acid than the second tobacco blend, and wherein at least 30% by weight of the lamina material in the first segment is air cured burley tobacco,
placing the first and second blends of smoking material in discrete segments in the wrapper material; and wrapping the wrapper material around the smokable material, forming a tobacco rod.

The blends are wrapped in a cigarette wrapper material for forming a tobacco rod. Preferably, the tobacco rod may be formed by alternately placing discrete segments of the first blend and second blend directly in the wrapper material such as a cigarette paper, for

example any of the cigarette papers discussed below. In this embodiment, the tobacco rod may be formed using a single wrapper rather than a multiple-wrapper method described below. The tobacco rod may then be combined with a mouthpiece as described below.

Alternatively, the blends are wrapped in a first and a second inner wrapper material, respectively, to form first and second tobacco rod segments, respectively. The first segment and second segment are then placed adjacent one another and the cigarette wrapper is wrapped around the segments to attach them to one another, forming the rod of smokable material. In preferred embodiments, the one or more endogenous smoke constituents includes TSNA.

Preferably, the first and second inner wrapper materials comprise paper, and one or both of the wrappers may comprise tobacco material. Preferably, the first and second inner wrapper materials are highly porous, for example having greater than about 5000 Coresta Units, more preferably greater than about 15000 Coresta Units, and most preferably greater than about

25000 Coresta Units. The cigarette wrapper preferably comprises paper. Preferably, the cigarette paper has a porosity between about 20 Coresta Units and about 300 Coresta Units, more preferably between about 30 Coresta Units and about 200 Coresta Units, most preferably between about 30 Coresta Units and about 100 Coresta Units. If the combined porosity of the inner wrappers and the cigarette wrapper are too low (for example, below about 15 Coresta Units), the cigarette may not provide consistent combustion and the cigarette may go out because of a lack of air flow.

Preferably the cigarette wrapper is wrapped completely along the total length formed by the abutting segments, so that the highly porous wrapping material of each segment is completely covered by the cigarette wrapper.

Preferably, the method further comprises the addition of a mouthpiece to the smoking article. The mouthpiece may be disposed adjacent the second segment and a tipping material may be wrapped around at least a portion of the mouthpiece and at least a portion of the second segment, combining the mouthpiece and the second segment.

Preferably, the first segment and second segment are initially produced as continuous rods of smokable material containing first blend and second blend, respectively. The continuous rods of smokable material are then cut into the appropriate relative lengths (for example, the relative lengths discussed above), and combined as described above.

Preferably, the overall length of smoking articles according to embodiments of the present invention with all filter segments intact is between about 70 mm and about 128 mm, more preferably about 84 mm.

Preferably, the external diameter of smoking articles according to embodiments of the present invention is between about 5 mm and 8.5 mm, more preferably about 7.9 mm.

The invention can be described further with reference to the following drawing.

Figure 1: A smoking article according to an embodiment of the invention.

Test results achieved by the inventive smoking article are also provided by the following table, which are further discussed below:

Table 1: Test results regarding tobacco specific nitrosamines constituents (TSNA) and formaldehyde formation produced by an inventive smoking article compared to various other configurations of smoking articles.