perform both these functions when sprayed on polylactic acid fibres. At least two separate additives are therefore needed for a polylactic acid based filter, in order for it to replicate these desirable features of a cellulose acetate based filter. This can add complexity to the manufacturing process and may also require modification of existing machinery.

Therefore, despite the perceived degradation benefits for filters containing polylactic acid, there is currently not a commercially acceptable solution for using polylactic acid as a filtration material in a mouthpiece for a smoking.

According to a first aspect of the present invention, there is provided a smoking article comprising: an aerosol generating substrate; and a mouthpiece attached to the aerosol generating substrate, the mouthpiece comprising a segment comprising: a filtration material comprising a plurality of fibres made of a blend comprising: at least about 80% polylactic acid by weight; less than about 15% polyglicolic acid by weight; and less than about 10% poly-(L)-lactic acid by weight;and an additive for reducing phenols; wherein the mouthpiece further comprises one or more wrappers circumscribing the segment, the one or more wrappers have a combined basis weight of at least about 50 grams per square metre (gm^{-2}).

There is provided a smoking article comprising an aerosol generating substrate and a mouthpiece attached to the aerosol generating substrate. The mouthpiece includes a segment comprising a filtration material comprising polylactic acid, and an additive for reducing phenols. The mouthpiece further comprises one or more wrappers circumscribing the segment, the one or more wrappers have a combined basis weight of at least about 50 grams per square metre (gm^{-2}).

According to a second aspect of the present invention, there is provided a mouthpiece for a smoking article, the mouthpiece comprising: a segment comprising: a filtration material comprising a plurality of fibres made of a blend comprising: at least about 80% polylactic acid by weight; less than about 15% polyglicolic acid by weight; and less than about 10% poly-(L)-lactic acid by weight; and an additive for reducing phenols; wherein the mouthpiece further comprises one or more wrappers circumscribing the segment, the one or more wrappers have a combined basis weight of at least about 50 grams per square metre (gm^{-2}).

There is also provided a mouthpiece for a smoking article. The mouthpiece includes a segment comprising a filtration material comprising polylactic acid, and an additive for reducing phenols. The mouthpiece further comprises one or more wrappers circumscribing the segment, the one or more wrappers have a combined basis weight of at least about 50 grams per square metre (gm^{-2}).

By circumscribing the segment with one or more wrappers have a combined basis weight of at least about 50 grams per square metre (gm^{-2}), a desired firmness for the mouthpiece may be achieved. This firmness may be comparable to the firmness that would otherwise have been provided by the combination of cellulose acetate and triacetin in a

conventional smoking article mouthpiece. The wrappers may be manufactured and provided around the segment in accordance with standard techniques.

Furthermore, since the one or more wrappers may enable the mouthpiece to have a desired firmness, there is no need for a second additive to be included in the mouthpiece in order to plasticize the filtration material. This means that the segment can be manufactured without modifying existing techniques or machinery. For example, if an additional additive was needed in order to provide firmness to the filtration material, a second spraying station could be needed for the filter manufacturing apparatus. This may require modification to existing machinery and may also require additional cleaning of parts of the machinery, such as the garniture tongue, resulting in undesirable downtime.

The inclusion of an additive for reducing phenols in the segment can help to reduce phenol levels delivered by the smoking article. This additive may be incorporated into the segment using a spraying station, which is typically used on existing machinery for incorporating a conventional additive, such as triacetin, into a conventional filter segment, such as one formed of cellulose acetate fibres.

Therefore, the present invention provides for a mouthpiece that incorporates polylactic acid as a filtration material, without sacrificing the firmness or phenol reducing capabilities that are typically associated with a conventional smoking article, and without needing to alter the machinery or processes that are typically used to manufacture such smoking articles.

The segment includes a filtration material comprising polylactic acid. The filtration material may have any suitable structure. For example, the filtration material may comprise a gathered sheet of material comprising polylactic acid. However, preferably the filtration material comprises a plurality of fibres formed at least in part from polylactic acid. Fibres are a particularly effective form of filtration material as they can provide tortuous passageways through which smoke can pass. Furthermore, when a smoking article is discarded after use, the fibres may degrade and disperse more readily than other structures, thus helping to improve the degradation properties of the mouthpiece or smoking article.

Preferably, the fibres are substantially unconnected to one another. That is, preferably no additive is included in the segment for binding the fibres together. This can help to improve the rate at which the fibres can degrade and disperse when a smoking article is discarded after use.

As mentioned in the first aspect, the filtration material is a blend comprising polylactic acid and at least one other polymer. The additional polymer or polymers may provide additional properties to the filtration material. For example, the additional polymers can provide the filtration material with additional tensile strength and elasticity properties. Where the filtration material comprises a plurality of fibres made of a blend of different polymers, this can enable the fibres to be processed on the same machinery that is typically used for manufacture of cellulose acetate filters, at a speed typically associated with the manufacture of cellulose acetate filters, and with a comparable waste percentage and operational efficiency.

Therefore, preferably, the filtration material is a blend comprising polylactic acid blended with at least one of polyglicolic acid and poly-(L)-lactic acid. As mentioned in the first aspect, the filtration material is a blend comprising polylactic acid, polyglicolic acid and poly-(L)-lactic acid. Such blends can result in a filtration material with desirable tensile strength and elasticity properties.

The filtration material comprises at least about 80% polylactic acid by weight, and even more preferably about 85% polylactic acid by weight.

The filtration material comprises less than about 15% polyglicolic acid by weight, and even more preferably about 10% polyglicolic acid by weight.

The filtration material comprises less than about 10% poly-(L)-lactic acid by weight, and even more preferably about 5% poly-(L)-lactic acid by weight.

In preferred embodiments the filtration material comprises a blend comprising about 85% by weight polylactic acid, about 10% by weight polyglicolic acid, and about 5% by weight poly-(L)-lactic acid.

As noted above, the segment comprising polylactic acid, also includes an additive for reducing phenols. That is, the segment includes an additive which is capable of capturing or otherwise converting at least some of the phenols produced by the smoking article.

Preferably, the additive does not bond elements of the filtration material together.

Preferably, the additive comprises at least one of triacetin, triethyl citrate (TEC), polyethylene glycol, a mixture of triacetin with cellulose acetate flakes, or any combination thereof.

One particularly preferred additive is an additive comprising a mixture of at least about 90% triacetin and less than about 10% cellulose acetate flakes, more preferably between about 96% and about 98% triacetin and between about 2% and about 4% cellulose acetate flakes. Such additives can be particularly desirable, as they can replicate the synergy between triacetin and cellulose acetate fibres in a standard cellulose acetate filter.

Another preferred additive is low-molecular-weight glycols, such as polyethylene or polyprophylene based glycols having a molecular weigth between about 100 and about 1000, more preferably between about 200 and about 800, even more preferably between about 300 and about 500. In one preferred embodiment, the additive is polyethylene glycol 400 (PEG 400).

Another preferred additive is triethyl citrate. As can be seen from Table 2 below, such an additive can be particularly effective at reducing phenols.

Preferably, the additive is a transparent liquid with no odor or taste. Preferably, the additive has a viscosity that is the same as or greater than the viscosity of triacetin. This can allow the additive to be added to the filtration material using the techniques and equipment normally used for applying triacetin to standard cellulose acetate filters.

Preferably, the additive is provided in an amount of at least about 0.1 percent by weight of the filtration material, more preferably at least about 5 percent by weight of the filtration material. Alternatively or additionally, the additive is preferably provided in an amount of less than about 15 percent by weight of the filtration material, more preferably less than about 12 percent by weight of the filtration material, even more preferably less than about 7 percent by weight of the filtration material.

CLAIMS

1. A smoking article comprising:

an aerosol generating substrate; and

a mouthpiece attached to the aerosol generating substrate, the mouthpiece comprising a segment comprising:

a filtration material comprising a plurality of fibres made of a blend comprising:

at least about 80% polylactic acid by weight;

less than about 15% polyglicolic acid by weight; and

less than about 10% poly-(L)-lactic acid by weight;and

an additive for reducing phenols;

wherein the mouthpiece further comprises one or more wrappers circumscribing the segment, the one or more wrappers have a combined basis weight of at least about 50 grams per square metre (gm^{-2}).

2. A smoking article according to claim 1 wherein the filtration material comprises a plurality of fibres substantially unconnected to one another.

3. A smoking article according to any preceding claim, wherein the additive for reducing phenols is dispersed amongst the filtration material.

4. A smoking article according to any preceding claim, wherein the additive for reducing phenols is the only additive provided in the segment.

5. A smoking article according to any preceding claim, wherein the one or more wrappers comprise a first wrapper, the first wrapper being in direct abutment with the filtration material and having a basis weight of at least about 50 grams per square metre (gm^{-2}).

6. A smoking article according to any preceding claim, wherein the mouthpiece segment has a hardness of at least about 75%.

7. A smoking article according to any preceding claim, wherein the mouthpiece segment has an ovality, after a 50% deformation of the mouthpiece segment, of less than about 25%.

8. A smoking article according to any preceding claim, wherein the one or more wrappers have a combined thickness of at least about 80 µm.

9. A smoking article according to any preceding claim, wherein the one or more wrappers have a combined bending stiffness, determined by International Organization for Standardization (ISO) test ISO 5628: 2012, of at least about 0.08 N in the machine direction of the wrapper.

10. A mouthpiece for a smoking article, the mouthpiece comprising:

a segment comprising:

a filtration material comprising a plurality of fibres made of a blend comprising:

at least about 80% polylactic acid by weight;

less than about 15% polyglicolic acid by weight; and

less than about 10% poly-(L)-lactic acid by weight; and

an additive for reducing phenols;

wherein the mouthpiece further comprises one or more wrappers circumscribing the segment, the one or more wrappers have a combined basis weight of at least about 50 grams per square metre (gm^{-2}).

11. A mouthpiece according to claim 10 or claim 11, wherein the one or more wrappers comprise a first wrapper, the first wrapper being in direct abutment with the filtration material and having a basis weight of at least about 50 grams per square metre (gm^{-2}).