SMOKING ARTICLE MOUTHPIECE WITH COOLING AGENT INCLUSION COMPLEX

The present disclosure relates to a smoking article with a mouthpiece that includes a cooling agent inclusion complex on an outer surface of the mouthpiece.

Smoking articles typically include a tobacco substrate portion and a mouthpiece portion. The mouthpiece portion contacts the mouth or lips of a consumer. Many combustible smoking articles, such as cigarettes, utilize a wrapper layer, known as a "tipping" wrapper to join the mouthpiece to the tobacco substrate. This wrapper layer typically forms the outer layer of the mouthpiece portion of the smoking article, or the layer that comes into contact with the mouth or lips of the consumer. Other smoking articles are designed to use heat, air flow, a chemical reaction, or a combination of these mechanisms, to deliver a component of the tobacco substrate to the consumer. Many of these non-combustible smoking articles also include a wrapper material around a mouthpiece portion, where the wrapper material comes into contact with the mouth or lips of the consumer.

Some smoking articles seek a refreshing sensation by utilizing a cooling agent such as menthol for example. These cooling agents provide a physiological cooling sensation when these cooling agents vaporize and are contacted with the human body and, in particular, with the mucous membranes of the mouth, nose and throat.

For certain smoking articles, it is desirable to provide a stable cooling agent on an outer surface of a smoking article mouthpiece to provide a cooling sensation to a user. It is desirable that this cooling agent remain on the intended surface of the smoking article mouthpiece so that the cooling agent can provide a predictable physiological cooling sensation to the user's lips during the smoking experience. It is also desirable that the stable cooling agent not provide unwanted volatile taste components that alter the expected taste experience provided by the smoking article.

~~According to the current disclosure~~In one aspect, there is provided a smoking article with a mouthpiece having an outer surface and a cooling agent inclusion complex disposed on the outer surface, the cooling agent inclusion complex is a cyclodextrin cooling agent inclusion complex comprising cyclodextrin and a cooling agent. In many embodiments, the cooling agent is a non-volatile compound or a non-menthol compound. The cooling agent can be a carboxamide containing compound or a menthoxy containing compound. The cooling agent and cyclodextrin inclusion complex does not migrate away from the surface on which it is disposed. In many embodiments, the inclusion complex comprises a cooling agent and a cyclodextrin compound, for example a

beta-cyclodextrin compound. Use of the cooling agent and cyclodextrin inclusion complex in the manufacture of a mouthpiece of a smoking article is further described below.

Smoking articles according to the present disclosure provide an effective way to provide a predictable physiological cooling sensation to the user's lips. It has been found that non-volatile cooling compounds disposed on a wrapper material of a smoking article may tend to migrate away from the surface to an inner portion of the smoking article where it cannot come into physical contact with the lips or fingers of the consumer. The cooling agent inclusion complex of the present disclosure remains stable and in place on the outer surface of the smoking article mouthpiece for an extended period of time. The cooling agent and cyclodextrin inclusion complex is odor-free and does not provide unwanted volatile taste components that alter the expected taste experience provided by the smoking article. The cooling agent inclusion complex can be disposed on tipping paper and then travel through the manufacturing and smoking article assembly process without affecting the stability of the cooling agent inclusion complex.

Another aspect of the disclosure relates to the use of a non-volatile cooling agent and cyclodextrin inclusion complex in the manufacture of a mouthpiece of a smoking article.

Yet another aspect of the disclosure relates to a method of providing a stable cooling sensation on the mouthpiece of a smoking article, the method comprising including a cyclodextrin inclusion complex comprising cyclodextrin and a cooling agent on the mouthpiece.

The term "cooling agent" refers to a compound that provides a physiological cooling sensation when contacted with the human body and, in particular, with the lips and fingers of the consumer.

The term "tipping" wrapper refers to a wrapping material that can be formed from paper or polymers or other materials and other optional filler materials. The tipping wrapper is disposed about at least a portion of a smoking article mouthpiece. Tipping wrapper typically joins the mouthpiece (such as filter element) to a tobacco substrate.

Preferably, the cooling agent is non-volatile. The term "non-volatile" refers to compounds or materials that do not evaporate readily at normal room temperature and pressure. Menthol, which can be referred to by its chemical name 2-isopropyl-5-methylcyclohexanol, is herein regarded as volatile. One measure of the term non-volatile is a compound or material having a vapour pressure less than menthol, that is, less than about 8.5 Pa, or less than about 5 Pa or less than about 2.5 Pa, all at 25 degrees centigrade.

The term "mouthpiece" refers to the portion of the smoking article that is designed to be contacted with the mouth of the consumer. In conventional smoking articles, this can be

Claims

1. A smoking article comprising;

a mouthpiece having an outer surface; and

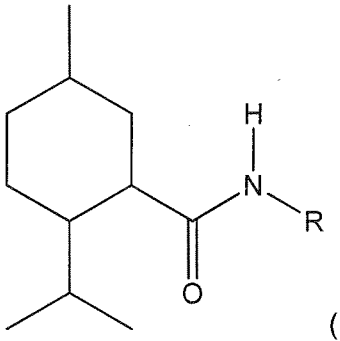
a cooling agent inclusion complex disposed on the outer surface, the cooling agent inclusion complex is a cyclodextrin cooling agent inclusion complex comprising cyclodextrin and a cooling agent.

~~2. A smoking article according to claim 1 wherein the cooling agent inclusion complex is a cyclodextrin cooling agent inclusion complex comprising cyclodextrin and a cooling agent.~~

~~3~~2. A smoking article according to claim~~s~~ 1 ~~or 2~~ wherein the cooling agent is non-volatile.

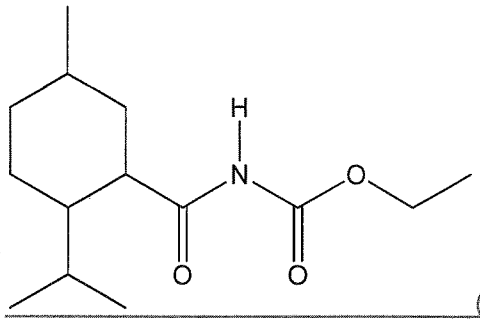
~~4~~3. A smoking article according to any one of the preceding claims wherein the cooling agent is a carboxamide containing compound.

~~5~~4. A smoking article according to claim ~~4~~3 wherein the carboxamide containing compound has the structure (I):



(I)

where R is a C1-C12 straight or branched chain alkyl or alkoxy, or arylene or pyridyl, or wherein the carboxamide containing compound has the structure (I-B):

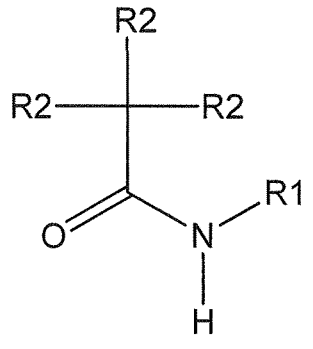


(I-B).

~~6~~5. A smoking article according to claim ~~4~~ 3 wherein the carboxamide containing compound is N-ethyl-p-menthane-3-carboxamide; ethyl 3-(p-menthane-3-carboxamido)acetate; N-(ethoxycarbonylmethyl)-p-menthane-3-carboxamide; N-(4-cyanomethylphenyl)-p-menthane carboxamide; N-(4-aminocarbonylphenyl)-p-menthane; or N-(4-methoxyphenyl)-p-menthanecarboxamide or N-(2-(pyridine-2-yl-)ethyl)-3-p-menthanecarboxamide.

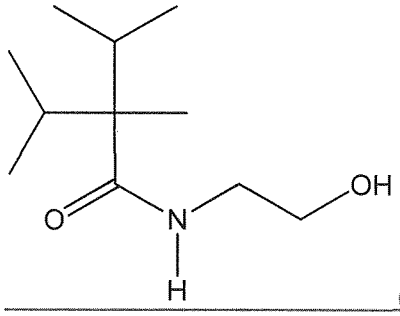
~~76~~. A smoking article according to claim 34 wherein the carboxamide containing compound is N-ethyl-p-menthane-3-carboxamide or ethyl 3-(p-menthane-3-carboxamido)acetate.

~~87~~. A smoking article according to claim 34 wherein the carboxamide containing compound has the structure (II):



(II)

where R1 is a C1-C6 straight or branched chain alkyl or alkoxy, and each R2 is independently selected from the group consisting of C1-C3 straight or branched chain alkyl, or wherein the carboxamide containing compound has the structure (II-C):



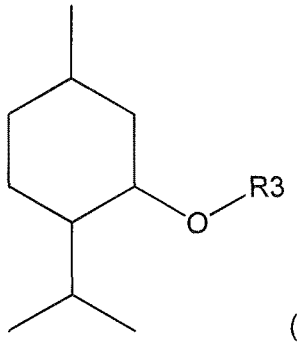
(II-C).

~~98~~. A smoking article according to claim 43 wherein the carboxamide containing compound is 2-isopropyl-N,2,3-trimethylbutanamide; N-(2-ethoxyethyl)-2,3-dimethyl-2-isopropylbutanamide; or N-(1-isopropyl-1-methylisobutyl)anisamide; or N-ethyl-2,2-diisopropylbutanamide; or N-(2-hydroxyethyl)-2-isopropyl-2,3-dimethylbutanamide.

~~109~~. A smoking article according to claim 34 wherein the carboxamide containing compound is 2-isopropyl-N,2,3-trimethylbutanamide.

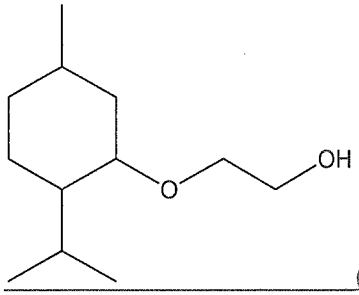
10~~1~~. A smoking article according to ~~any one of~~ claims 1 ~~to 3~~or 2 wherein the cooling agent is a menthoxy containing compound.

121. A smoking article according to claim 110 wherein the menthoxy containing compound has the structure (III):



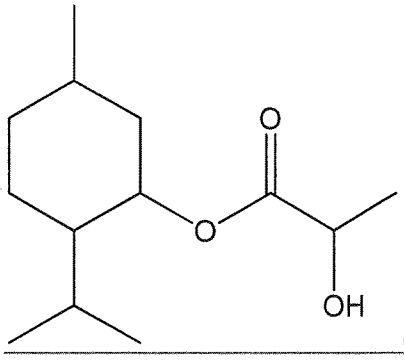
(III)

where R3 is a C1-C6 straight or branched chain alkyl or alkoxy, or wherein the menthoxy containing compound has the structure (III-A):



(III-A),

or wherein the menthoxy containing compound has the structure (III-C):



(III-C).

132. A smoking article according to claim 140 wherein the menthoxy containing compound is menthyl lactate; monomenthyl succinate; monomenthyl glutarate; menthyl pyrrolidin-2-one-5-carboxylate; menthyl ester of 4-(N,N-dimethylamino)-4-oxobutanoic acid; menthyl 3-hydroxybutyrate; 3-l-menthoxypropane-1,2-diol; 2-l-menthoxyethanol; menthone glycerol ketal; p-menthane-3,8-diol; or menthyl methyl ether.

143. Use of non-volatile cooling agent and cyclodextrin inclusion complex in the manufacture of a mouthpiece of a smoking article.

154. Method of providing a stable cooling sensation on the mouthpiece of a smoking article, the method comprising including a cyclodextrin inclusion complex comprising cyclodextrin and a cooling agent on the mouthpiece.