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(54) Improvements relating to smoking articles

Rauchartikel

Articles à fumer

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- **World Tobacco, 59 (1978), p. 89**

Remarks:

The file contains technical information submitted after the application was filed and not included in this specification

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Description

The invention the subject of this application relates to cigarettes and similar smoking articles.

The use of humectant in the tobacco of smoking articles is illustrated in European Patent Application, Publication No. 0 067 601. The use of expanded tobacco in smoking articles is also known. US Patent No. 4,310,006 describes a high order expansion process utilising liquid carbon dioxide as the expansion agent. The tobacco is prior treated with humectant before expansion to lower the freezing point of the tobacco. However, conventional levels of expanded tobacco in the tobacco blend of a smoking article are usually of the order of less than 30%, and usually less than 25%, by weight of the tobacco in the smoking article, even in those markets where the weight of the cigarette is of great importance, because of the lack of taste and flavour characteristics.

It is an object of the subject invention to provide a cigarette which is of a low tar delivery but which is sensorily acceptable to the smoker.

The subject invention provides a smoking article comprising cut tobacco and a paper wrapper circumscribing said tobacco, a major portion at least of said tobacco having been treated with a humectant to provide a loading level of said humectant of 6% to 15% by weight of said tobacco, said tobacco comprising expanded tobacco, the packing density of said tobacco rod not exceeding 210 mg/cc, and wherein, when said article is smoked under standard machine smoking conditions, the particulate matter delivery on a water, nicotine and humectant free basis to nicotine delivery ratio is not more than 6 to 1. Suitably, the loading level of the humectant on the tobacco does not exceed 12%. More suitably, the loading level is in the range of 7 - 10%, 9% for example.

The humectant is suitably one or more of glycerol, propylene glycol, sorbitol and diethylene glycol.

Advantageously, the humectant is applied to the tobacco prior to the tobacco being subjected to an expansion process. The loading level of the humectant on the tobacco prior to expansion may be in a range of about 5% to about 20% in order to result in a post expansion level of 4% to 15%.

We have found that if the humectant is applied to the tobacco before rather than after the tobacco is subjected to the expansion process, a reduction in tobacco strand length during the process is avoided. Further advantages of applying the humectant prior to expansion reside in the avoidance of an undesirably high equilibrium moisture content post expansion and the avoidance of a reduction in the filling power of the expanded tobacco.

Suitably, the humectant is applied to the tobacco by being sprayed thereon, advantageously in aqueous solution. The humectant should, before the tobacco is subjected to the expansion process, be distributed on the tobacco with a significant degree of uniformity, which objective may be furthered by tumbling the tobacco and/or allowing the tobacco to stand in bulk for a sufficient time after the application of the humectant.

Tobacco of smoking articles according to the subject invention which is to be subjected to an expansion process is suitably pre-conditioned to a moisture content in a range of 22% to 30% and preferably to a moisture content in a range of 26% to 30%.

Tobacco of smoking articles according to the subject invention which is subjected to an expansion process may be lamina and/or stem tobacco. The expanded tobacco advantageously comprises a lamina tobacco the product of a tobacco expansion process which is effective to provide a high degree of expansion in tobacco subjected to the process. High expansion processes are disclosed, for example, in the specification of United States Reissue Patent No. 30,693 and in United Kingdom Patent Specification Nos. 1,570,270 and 2 160 408A. By use of high expansion processes, tobacco expansion values, in terms of filling value increase, of from about, typically, 75% and even up to about 125% may be obtained. Tobacco which has been subjected to a high expansion process may have a bulk density of, for example, from about 100 mg/cc to about 200 mg/cc, and preferably not less than 150 mg/cc, as measured using a Borgwaldt Densimeter.

A minor proportion of the smoking material of smoking articles according to the subject invention may take the form of reconstituted tobacco and/or tobacco substitute material. Preferably though, the smoking material should be wholly natural cut tobacco. It is also preferable that the whole or a substantial proportion of the cut tobacco of smoking articles according to the subject invention should be expanded tobacco and that the whole of this expanded tobacco should have been treated with humectant prior to being expanded. Suitably, at least 65% of the tobacco is treated expanded tobacco, and more suitably 70% is treated expanded tobacco.

The weight of the smoking material in a cigarette according to the subject invention is suitably in a range of 500 to 800 mg.

It is to be observed that when measurement is made of the PMWNF delivery of a smoking article according to the subject invention, the value obtained includes a proportion of the humectant. It may thus be of interest to express particulate matter delivery on a water, nicotine and humectant free basis (PMWNHF). Preferably, the PMWNHF to nicotine delivery ratio of smoking articles according to the subject invention is in the region of 6 to 1, and more preferably in the region of about 5 to 1.

The humectant in the mainstream smoke of cigarettes according to the subject invention, as measured under standard machine smoking conditions, preferably forms not less than 15%, and more preferably not less than 20%, of the mainstream PMWNF. Yet more preferably the mainstream smoke humectant forms approximately 25% of the mainstream PMWNF. Suitably, the

mainstream smoke humectant may also be in the range of 24% to 26%, 24% for example.

A burn retardant may be used in smoking articles in accordance with the subject invention. The burn retardant may be, for example, magnesium chloride, sodium chloride, ammonium sulphate, ammonium lactate, or mixtures thereof, applied to the smoking material.

In order to further the understanding of the subject invention, examples according thereto will now be described.

EXAMPLE I

To a cut tobacco blend comprising 20% water treated stem, 40% burley tobacco lamina and 40% flue cured tobacco lamina there was added glycerol at a 10% loading level and magnesium chloride at a 1% loading level. The blend was conditioned to 25% moisture content, the blend being thereafter subjected to a high level expansion process. The glycerol loading on the expanded tobacco was about 6%.

Using the thus obtained expanded tobacco, 24.75 mm circumference cigarettes were made. Each cigarette comprised a 64 mm long tobacco rod consisting of 100% of the expanded tobacco and of wrapper of a standard commercial cigarette paper. The packing density of the tobacco in the tobacco rods was about 145 mg/cc. To each of the tobacco rods there was attached, by a tipping wrapper, a 20 mm long cellulose acetate filter plug. The cigarettes were laser ventilated at the filters to provide a ventilation value of 55%.

These cigarettes were smoked under standard (Coresta) machine smoking conditions according to which a 35 cm^3 puff of two seconds duration is taken every minute and were found to yield mainstream smoke component deliveries as follows.

Component	Delivery (mg)
TPM	5.88
Nicotine	0.63
PMWNF	4.37
Glycerol	1.35
PMWNHF	3.02

It is thus to be observed that the PMWNHF to nicotine ratio was 4.8. It may also be observed that the glycerol delivery represented 31% of the PMWNF delivery.

It was found that when smoked under Coresta machine smoking conditions, a commercially available cigarette, Benson & Hedges Ultra (Trade Mark), of similar delivery, i.e. 5.57 mg TPM, had a mainstream glycerol delivery of 0.44 mg, this representing 9.4 per cent of the PMWNF delivery. The PMWNHF to nicotine ratio of the Ultra cigarettes was 9.9.

In sensory panel smoking tests it was found that the above detailed cigarettes according to the subject invention exhibited sensory features superior to those of the Ultra cigarettes.

EXAMPLE II

A cut tobacco blend comprised 25% burley lamina, 40% flue cured lamina, 25% water treated stem and 10% sun cured oriental lamina. To this blend was added glycerol at a 10% loading level and magnesium chloride at a 1% loading level. The blend was thereafter subjected to a high level expansion process. The glycerol loading level on the expanded tobacco was 8%.

Using the thus obtained tobacco cigarettes were made which were to the same format as the cigarettes according to the invention of Example I. When smoked under standard machine smoking conditions, mainstream smoke component deliveries were found to be as follows:

Component	Delivery (mg)
TPM	6.55
Nicotine	0.54
PMWNF	4.93
Glycerol	1.63
PMWNHF	3.30

Thus the PMWNHF to nicotine ratio was 6.1 and the humectant represented 33% of the PMWNF.

Claims

1. A smoking article comprising a tobacco rod, which rod comprises cut tobacco and a paper wrapper circumscribing said tobacco, a major portion at least of said tobacco having been treated with a humectant to provide a loading level of said humectant of 6% to 15% by weight of said tobacco, said tobacco comprising expanded tobacco, the packing density of said tobacco rod not exceeding 210 mg/cc, and wherein, when said article is smoked under standard machine smoking conditions, the particulate matter delivery on a water, nicotine and humectant free basis to nicotine delivery ratio is not more than 6 to 1.

2. A smoking article according to Claim 1, wherein said loading level is not less than 7%.

3. A smoking article according to Claim 1 or 2, wherein said loading level does not exceed 12%.

4. A smoking article according to Claim 3, wherein

said loading level does not exceed 10%.

5. A smoking article according to any one of the preceding claims, wherein the humectant is one or more of glycerol, propylene glycol, sorbitol and diethylene glycol.

6. A smoking article according to any one of the preceding claims, wherein the bulk density of said tobacco which has been expanded is from about 100 mg/cc to about 200 mg/cc.

7. A smoking article according to any one of the preceding claims, wherein the expanded tobacco of said rod comprises at least 65% of the whole of the tobacco of said rod.

8. A smoking article according to Claim 7, wherein said expanded tobacco was treated with humectant prior to expansion.

Patentansprüche

1. Rauchbarer Artikel mit einem Tabakstrang, wobei der Tabakstrang Schnittabak und eine den Tabak umgrenzende Papierumhüllung aufweist, wobei zumindest ein größerer Teil des Tabaks mit einem Feuchthaltemittel behandelt worden ist, um einen Beladungswert dieses Feuchthaltemittels von 6 bis 15 Gew.-% des Tabaks zur Verfügung zu stellen, wobei der Tabak expandierten Tabak aufweist, wobei die Packungsdichte des Tabakstrangs nicht 210 mg/cm^3 übersteigt, und wobei, wenn der Artikel unter Standardmaschinen-Rauchbedingungen abgeraucht wird, das Verhältnis der Partikel-Materialabgabe auf einer wasser-, nikotin- und feuchthaltemittelfreien Basis zur Nikotinabgabe nicht mehr als 6 : 1 ist.

2. Rauchbarer Artikel nach Anspruch 1, bei dem der Beladungswert nicht geringer als 7 % ist.

3. Rauchbarer Artikel nach Anspruch 1 oder 2, bei dem der Beladungswert 12 % nicht übersteigt.

4. Rauchbarer Artikel nach Anspruch 3, bei dem der Beladungswert 10 % nicht übersteigt.

5. Rauchbarer Artikel nach einem der vorhergehenden Ansprüche, bei dem das Feuchthaltemittel eine oder mehrere der folgenden Substanzen ist: Glycerol, Propylenglykol, Sorbitol und Diethylenglykol.

6. Rauchbarer Artikel nach einem der vorhergehenden Ansprüche, bei dem die Fülldichte des Tabaks, welcher expandiert worden ist, von ungefähr 100 mg/cm^3 bis ungefähr 200 mg/cc beträgt.

7. Rauchbarer Artikel nach einem der vorhergehenden Ansprüche, bei dem der expandierte Tabak des Stranges mindestens 65 % des gesamten Tabaks des Stranges aufweist.

8. Rauchbarer Artikel nach Anspruch 7, bei dem der expandierte Tabak vor der Expansion mit Feuchthaltemittel behandelt wurde.

Revendications

1. Un produit à fumer comprenant un boudin de tabac lequel boudin comporte du tabac coupé et une enveloppe de papier entourant ce tabac, dont une majeure partie au moins dudit tabac a été traitée par un agent d'humidification pour apporter un niveau de charge de cet agent d'humification allant de 6 à 15% en poids dudit tabac, ledit tabac comprenant du tabac expansé, la masse volumique de ce boudin de tabac n'excédant pas 210 mg/cm^3, et dans lequel, quand le produit est fumé sur une machine dans des conditions standards, l'émission de matières particulaire sur un base exempte d'eau, de nicotine et d'agent d'humidification rapportée à l'émission de nicotine ne dépasse pas 6 : 1.

2. Un produit à fumer selon la revendication 1, dans lequel le niveau de charge est au moins de 7%.

3. Un produit à fumer selon une des revendications 1 ou 2, dans lequel le niveau de charge n'excède pas 12%.

4. Un produit à fumer selon la revendication 3, dans lequel le niveau de charge n'excède pas 10%.

5. Un produit à fumer selon l'une quelconque des revendications précédentes, dans lequel l'agent d'humidification est constitué d'un ou plusieurs des composés suivants: glycérol propylène glycol, sorbitol et diéthylène glycol.

6. Un produit à fumer selon l'une quelconque des revendications précédentes, dans lequel la masse volumique apparente du tabac qui a été expansé va d'environ 100 mg/cm^3 à environ 200 mg/cm^3.

7. Un produit à fumer selon l'une quelconque des revendications précédentes, dans lequel le tabac expansé dudit boudin représente au moins 65% de la totalité du tabac de ce boudin.

8. Un produit à fumer selon la revendication 7, dans lequel le tabac expansé a été traité par un agent d'humidification avant expansion.