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(54) **Improvements relating to smoking articles**

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EP-A- 0 579 410 **EP-A- 0 608 047**
EP-A- 0 628 260 **FR-A- 2 669 240**
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Description

[0001] The present invention relates to smoking articles comprising filter elements having means to reduce vapour phase constituents of tobacco smoke therein.

[0002] After smoking of a smoking article, such as a filter-tipped cigarette, has occurred the remaining butt or unsmoked remnant of the smoking article often exhibits a strong smell which becomes quite a stale smoke smell, especially over extended periods of time. It is presently desirable to provide some means of removing or significantly reducing the stale smoke smell which emanates from the particulate matter deposited in the butt end of a smoking article.

[0003] Our co-pending Application No. EP 649607 filed on 26 September 1994 describe various methods of deodorising a tobacco smoke filter element. These methods all require the smoker to break a capsule containing deodorising material, the capsule being held within the tobacco smoke filter element, when the smoker stubs out his butt or unsmoked remnant of the smoking article. A disadvantage of these methods is that our research has now shown that a minority of smokers do not actively stub out their butts in a manner which results in the deodorising capsule breaking and releasing the deodorising material.

[0004] The present invention seeks to overcome the need for an active part to be played by the smoker once smoking of a smoking article has ceased. It is an object of the present invention to provide a smoking article incorporating a tobacco smoke filter element which, even after smoking has occurred, still exhibits, in a passive manner, a deodorising property.

[0005] As used herein the term 'passive' or 'passive manner' means that no actual part is required of the smoker in order for the remnant of the smoking article or butt to exhibit a deodorising property.

[0006] The present invention provides a smoking article comprising a tobacco smoke filter element and a wrapped rod of tobacco filler material interconnected by a tipping wrapper, the filter element comprising absorbing material for absorbing the vapour phase constituents of smoke, a tobacco smoke flow path, the tobacco smoke being substantially confined to the tobacco smoke flow path, the absorbing material removing the vapour phase constituents from the tobacco smoke by diffusion of the vapour phase constituents from the tobacco smoke into the absorbing material, and the absorbing material exhibiting the further technical effect of being capable, even after smoking has finished, of absorbing vapour phases emanating from odorous compounds found within the smoked filter element.

[0007] The use of carbon or activated carbon in tobacco smoke filter elements to reduce vapour phase constituents of smoke has been known for some while. Our co-pending European Patent Application No. 93305082.5 teaches a tobacco smoke filter element having a carbon section, which carbon section is not contacted by the particulate smoke phase. Ventilation means is utilised at a specific location to channel the tobacco smoke away from the filter so that the carbon section does not become contaminated by the tobacco smoke.

[0008] We have now discovered that the arrangement described in the aforesaid pending European application also exhibits an excellent deodorising property and is one embodiment of the present invention.

[0009] European Patent Applications, Publication Nos. 0 608 047 and 0 628 260 describe (i) a so-called 'dalmation' filter in which carbon particles are distributed throughout the filtration material and (ii) a filter element having carbon contained in the paper plugwrap, respectively. FR 2 669 240 (equivalent to GB 2 249 936) describes the use of particulate carbon adhered over the surface of a plugwrap material. US Patent No. 3,297,038 describes a capsule containing an activated material, such as charcoal, which is ruptured by the smoker before lighting the cigarette. All of these documents utilise carbon to reduce the vapour phase of the smoke during smoking. The smoke from the lit article is also allowed to contact the carbon to a great extent, thus the carbon becomes contaminated by other than the vapour phase components of smoke.

[0010] Advantageously the vapour phase absorbing material is located annularly about the tobacco smoke flow path. Preferably the absorbing material is held on material, such as plugwrap, enwrapping the tobacco smoke flow path. Even more preferably, the absorbing material is located in longitudinally spaced arrangement along the length of the plugwrap. This arrangement enables cutting of the unitary filter element to provide in an integral member a double or triple filter-type arrangement without the requirement to cut through material loaded with abrasive granules of absorbing material, for example, carbon, activated carbon or other well-known vapour phase absorbing materials.

[0011] The vapour phase absorbing material for use in the present invention may advantageously be carbon or activated carbon, suitably in granular form. Other suitable absorbing materials, such as silica, zeolites, Attapulgitic clay, high surface area chalk, magnesium hydroxide, for example, or synthetic high surface area absorbing materials will be known and obvious to the skilled reader.

[0012] Preferably the tobacco smoke flow path comprises fibrous filtration material, such as cellulose acetate. Preferably the tobacco smoke is confined to the tobacco smoke flow path by channelling the smoke away from the vapour phase absorbing material. More preferably channelling is produced by ventilating into the upstream end of the filter element. Preferably the upstream end of the filter element comprises material not coated with absorbing material. Ventilation into that part of the material causes no tobacco smoke at all to contact the absorbing material. The material, at least in this area, may suitably be permeable, although where ventilation in to the filter element is achieved by

perforating both the tipping wrapper and the material, this is not essential.

[0013] In another embodiment, the vapour phase absorbing material is located in a recess or recesses in filtration material which provides a tobacco smoke flow path. The recess or recesses may advantageously be a groove or grooves extending longitudinally on the surface of the filter element. The vapour phase absorbing material may be attached to plugwrap material at spaced locations which register with the recess or recesses in the surface of the filtration material providing a tobacco smoke flow path.

[0014] Alternatively, the recess or recesses may be located axially disposed within the filter element as a core, which core may be shaped on the surface thereof. Filtration material suitably surrounds the core. In both of the above embodiments, the recess or recesses may suitably be physically separated from the filtration material by a wrapper, which may be vapour phase permeable.

[0015] In a related but alternative embodiment the tobacco smoke filter element comprises a central core of vapour phase absorbing material, about which is arranged an annulus of tobacco smoke filtration material, such as cellulose acetate. Other suitable filtration materials include fibrous polypropylene or polyethylene tow.

[0016] The core of absorbing material is advantageously wrapped with a vapour phase permeable wrapper to allow diffusion of vapour phase constituents into the core but to protect the absorbing material from contact with the particulate phase of the tobacco smoke. A barrier disc may be coaxially arranged at the tobacco end of the core to ensure that no smoke passes along the core.

[0017] The converse of this arrangement is also a suitable embodiment of the present invention, i.e. a sheath of absorbing material is located around a central core of filtration material. The core of filtration material may advantageously be wrapped with a vapour phase permeable wrapper.

[0018] In a similar but again alternative embodiment, the vapour phase absorbing material may be enclosed in an encapsulating material to form a capsule containing vapour phase absorbing material. The capsule is suitably elongate and extends coaxially lengthwise within the filter element. The ends of the capsule are impermeable to tobacco smoke flow, particularly the particulate matter of tobacco smoke but not necessarily the vapour phase constituents of tobacco smoke. The walls of the capsule along their lengthwise extent are advantageously perforated to enable vapour phase constituents of smoke to diffuse into the capsule and contact the core of absorbing material.

[0019] Preferably the pressure drop of the filtration material tobacco smoke flow path is less than the pressure drop of the capsule of absorbing material. Ventilation may be used to assist in this goal.

[0020] In yet a further alternative, the vapour phase absorbing material may be present in the plugwrap of the filter element. The absorbing material is, therefore, incorporated in the furnish of the plugwrap as the plugwrap is manufactured. Preferably the absorbing material, if it absorbs water from the paper making stage, releases the water on drying of the paper.

[0021] Diffusion of the vapour phase constituents of tobacco smoke into the absorbing material occurs in all embodiments of the invention.

[0022] In order that the invention may be easily understood and readily carried into effect, reference will now be made, by way of example, to the accompanying diagrammatic drawings, in which;

Figure 1 shows part of a smoking article according to the present invention,

Figure 2 shows a cross-section of a filter element incorporated in a smoking article according to a further embodiment of the present invention,

Figure 3 shows part of a smoking article according to another aspect of the present invention,

Figure 4 shows part of a smoking article according to an alternative embodiment of the present invention; and

Figure 5 shows part of a smoking article which is yet another embodiment of the present invention.

[0023] In Figure 1 there is depicted part of a cigarette 1 comprising a wrapped rod 2 of tobacco filler material, such as cut tobacco lamina and a proportion of stem. The tobacco filler material may comprise a proportion of expanded tobacco. The filter element 3 comprises a body 4 of fibrous cellulose acetate filtration material. The filtration material could also be polypropylene or polyethylene fibrous material, paper, or polyethylene film material, which may be a separate unit. The body 4 of fibrous filtration material is wrapped in a plugwrap 5. The body 4 of filtration material provides a tobacco smoke flow path. A central portion 6 of the plugwrap 5 is coated on the inner side thereof with a layer of adhesive and a vapour phase absorbing material, in this instance granular carbon material. At the upstream side of the absorbing material, the overwrapping tipping material 7 is provided with perforations 8 which are either located in the tipping or extend through the tipping and the plugwrap into the body 4 of filtration material. The perforations 8 serve to channel the tobacco smoke into the centre of the body 4 of filtration material. In this way the tobacco smoke is substantially all confined to the tobacco smoke flow path within the body 4 of filtration material and does not come into contact with the vapour phase absorbing material.

[0024] In operation, the filter element 3 serves to filter particulate matter from the tobacco smoke of a lit wrapped rod 2, whilst vapour phase constituents diffuse outwardly during smoking of the cigarette 1 and are absorbed by the

absorbing material 6. Because the tobacco smoke is constrained towards the centre of the body 4 of filtration material, the absorbing material is not contaminated with all of the components of tobacco smoke and is therefore very effective at reducing the vapour phase constituents of smoke.

[0025] Furthermore, owing to the lack of contamination and, hence, enhanced effectiveness of the absorbing material, the absorbing material is also able to absorb the vapour compounds emanating from odorous material in the particulate matter within the smoked remnant, or butt, of the cigarette 1. This reduces the undesirable stale smoke odour present in cigarette butts after smoking has ceased. The filter element thus serves a dual absorbing purpose, absorbing compounds both during and after smoking.

[0026] Subjective tests of cigarettes according to this invention with carbon loading levels of about 25mg per cigarette which have been smoked and the butts left in a sealed container show that, compared to control cigarettes with conventional cellulose acetate filter elements, cigarettes according to the present invention exhibit a significant reduction in stale smoke odour.

[0027] The level of decrease in smoke odour compounds can be measured against a control smoked cigarette butt using, for example, an DL-101 Photo Ionisation Analyser made by HNU Systems Inc. The results of smoking cigarettes according to the invention against control cigarettes are given in Table 1 below. In the experiment, the control cigarette comprised a conventional filter element of fibrous cellulose acetate, 37mm in length, and a 58mm long tobacco rod comprising cut Virginia tobacco wrapped in a paper wrapper having a permeability of 50 CU and treated with 1% potassium citrate. The control cigarette is what might be termed a conventional cigarette.

[0028] The cigarettes smoked against the control cigarette were of the same format as the control cigarette. Smoking was carried out to a butt length of 36mm under standard machine smoking conditions according to which a 35cm³ puff of two seconds duration is taken every minute. Two comparative cigarettes containing carbon were used. The first cigarette comprised a conventional dual carbon filter element having two adjacent separate lengths one length of 17mm, comprising fibrous cellulose acetate and the other length of 9mm, comprising carbon granules distributed throughout fibrous cellulose acetate. The second cigarette was a cigarette according to the present invention and comprised an integral cellulose acetate filter element 26mm long wrapped in a plugwrap comprising a central portion having carbon granules adhered to the inner face thereof in accordance with Figure 1 hereof. This type of filter element is known as an Active Patch Filter (RTM).

[0029] Two cigarettes of each type of cigarette were smoked and the butts of each pair of smoked cigarettes placed in sealed plastic containers. The lid of the container is removed and the probe of Photo Ionisation Analyser was quickly inserted a fixed amount into each container for a fixed time of 5-10 seconds. The maximum instantaneous reading from the detector is recorded in Table 1.

TABLE 1

Sample	Maximum instantaneous photoionisation detector reading (ppm equivalent of benzene)		Subjective ranking after 20 Hrs.*
	1 Hr. after smoking	20 Hrs. after smoking	
Control (cellulose acetate filter)	36.3	31.4	1
Dual carbon/CA filter	43.5	36.7	2
Active patch filter	43.1	29.7	3
Active patch 18% ventilation	31.1	17.1	4=
Dual carbon/CA 40% ventilation	33.9	31.3	4=
Active patch 40% ventilation	27.2	14.6	6

* The subjective ranking is such that the lowest ranking indicates the most intense odour.

ranking indicates the most intense odour.

[0030] It can be seen from Table 1 that the dual carbon filter and the unventilated active patch carbon filter exhibit better reduction in smoke odour after 1 hour. In contrast, ventilation of the active patch filter exhibits a marked reduction in smoke odour at 18% ventilation and an even more pronounced reduction at 40% ventilation. It can also be seen that the vapour phase odour compounds continue to be absorbed over the 20 hours after smoking.

[0031] Ventilation of the dual acetate filter appears to give some reduction in smoke odour after 1 hour but no continued absorption over 20 hours. Some dissipation of smoke odour occurs with all samples over 20 hours.

[0032] Table 1 also includes the subjective ranking assigned to the cigarette after 20 hours. The 40% ventilated active patch filter gives the best smoke odour reduction subjectively.

[0033] Suitably the loading level of carbon as the absorbing material is within the range of 15-100mg per cigarette filter element. Other absorbing materials may vary from the range but can readily be determined by experimentation and will, of course, depend on the absorbing capability and/or surface area of the selected absorbing material.

[0034] Figure 2 shows in cross-section the filter element of a second embodiment of the inventive concept. Filter element 10 comprises a tobacco smoke flow path 11 of fibrous cellulose acetate filtration material. Non-wrapped acetate may also be utilised. The filtration material has been, for example, thermally moulded to provide grooves 12 on the surface of the filter element 10. The filtration material may be provided with a vapour phase permeable wrapper 13 which physically separates the filtration material from vapour phase absorbing material 14 located within the grooves 12. The wrapper 13 is not an essential feature. The vapour phase absorbing material 14 is activated carbon in the form of granules. The carbon is adhered to plugwrap 15 which enwraps the filter element along the longitudinal extent thereof. Alternatively, the carbon may be adhered to the surface of the filtration material.

[0035] Tobacco smoke is constrained to flow substantially only through the filtration material. Vapour phase smoke constituents can diffuse outwardly into the carbon granules. This arrangement allows the vapour phase absorbing material 14 to further absorb vapour phases from the odorous material found in smoked cigarette filter elements.

[0036] The converse arrangement of absorbing material and filtration material is a further embodiment of the inventive concept.

[0037] Figure 3 depicts a cigarette 31 according to the present invention comprising a wrapped rod 32 of tobacco filler material interconnected by a tipping wrapper 37 to a filter element 33 comprising a body 34 of a fibrous filtration material, such as cellulose acetate, and an elongate capsule 35 containing vapour phase absorbing material such as granular carbon. The capsule 35 is enclosed in an encapsulating material which prevents the inflow of tobacco smoke therein at either end. Along the length of the walls of the capsule 35 are perforations 36 which enable vapour phase constituents to diffuse into contact with the absorbing material. The filter element is arranged so that the tobacco smoke is constrained to flow within the body 34 of filtration material and particulate matter from the smoke does not contaminate the absorbing material.

[0038] In this embodiment, the pressure drop of the capsule and the surrounding filtration material are arranged so that the tobacco smoke is constrained to flow along the tobacco smoke flow path, separate from the vapour phase absorbing material.

[0039] The embodiment of the invention depicted in Figure 4 shows a cigarette 101 having a wrapped rod 20 of tobacco filler material and a filter element 30 interattached by tipping wrapper 70. Filter element 30 comprises an annular body 40 of filtration material, such as fibrous cellulose acetate, wrapped in a plugwrap. As a core 19 within the body 40 there is located carbon as an absorbing material. The core 19 is provided with a wrapper 100 which is permeable to the vapour phases of tobacco smoke and thus prevent contamination of the absorbing material by particulate matter of tobacco smoke.

[0040] The filter element 30 is ideally arranged so that the pressure drop of the core 19 is greater than the pressure drop of the annular body 40, whereby the tobacco smoke is constrained to flow along the tobacco smoke flow path of body 40. Where the pressure drops of the various materials do not readily allow this to occur, a barrier 21 may be utilised, possibly in addition to wrapper 100, to prevent smoke flowing along the core 19.

[0041] The embodiments of Figures 3 and 4 may not rely solely on the pressure drop arrangement of the core of absorbing material and the body of filtration material in order to constrain the tobacco smoke substantially to the tobacco smoke flow path provided by the filtration material. The tobacco smoke may be confined to the tobacco smoke flow path because the particulate matter of the smoke is physically prevented from contacting the vapour phase absorbing material.

[0042] Figure 5 depicts a conventional filter element 300 of fibrous cellulose acetate filtration material interattached to a wrapped rod 200 of tobacco filler material by a tipping wrapper 700. A plugwrap 500 incorporated vapour phase absorbing material therewithin. Ventilation perforations may be provided if so desired. Tobacco smoke is confined to the flow path provided by the filtration material, whilst vapour phase smoke constituents can diffuse outwardly to the plugwrap.

[0043] In all of the above embodiments, after absorbing vapour phase constituents from the smoke the absorbing material is able to absorb the vapour phases emanating from odorous compounds found within a smoked cigarette butt, thus decreasing the stale smoke odour.

[0044] In subjective smoke tests of cigarettes according to the embodiments described with respect to Figures 3, 4 and 5 of the present invention with carbon loading levels of about 25mg smoked against control cigarettes containing no carbon, the inventive cigarettes exhibited a noticeable reduction in stale tobacco smoke odour when sealed containers containing the inventive and control cigarette butts were opened and compared. The level of decrease in smoke odour compounds can be measured against a control smoked cigarette butt using a DL-101 Photo Ionisation Analyser made by HNU Systems Inc.

[0045] Suitably the loading level of carbon as the absorbing material is within the range of 15-100mg per cigarette filter element. Other absorbing material may vary from this range but can readily be determined by experimentation and will, of course, depend on the absorbing capability and/or surface area of the selected absorbing material.

Claims

1. A smoking article comprising a tobacco smoke filter element and a wrapped rod of tobacco filler material interconnected by a tipping wrapper, the filter element comprising absorbing material for absorbing vapour phase constituents of smoke, a tobacco smoke flow path, the tobacco smoke being substantially confined to said tobacco smoke flow path separate from said absorbing material either by providing ventilation means to channel the smoke away from said vapour phase absorbing material located in grooves in the filtration material, which grooves extend longitudinally along the surface of said filter element, or in one or more recesses disposed within said filter element as a core, disposed about which is filtration material, which filtration material provides a tobacco smoke flow path, or by providing a physical barrier for particulate tobacco smoke between said tobacco smoke and said vapour phase absorbing material, said physical barrier being either a vapour phase permeable wrapper, a barrier disc coaxially arranged at the tobacco end of a core of vapour phase absorbing material, an encapsulated material having a vapour permeable region, or a combination of vapour phase permeable wrapper and a barrier disc coaxially arranged at the tobacco end of a core of vapour phase absorbing material, said absorbing material removing vapour phase constituents from said tobacco smoke by diffusion of vapour phase constituents from said tobacco smoke into said absorbing material, and said absorbing material exhibiting the further technical effect of being capable, even after smoking has finished, of absorbing vapour phases emanating from odorous compounds found within the smoked filter element, thereby deodorising the smoked butt of said smoking article.
2. A smoking article according to Claim 1, wherein said tobacco smoke flow path comprises fibrous filtration material.
3. A smoking article according to Claim 1, wherein said core of vapour phase absorbing material is wrapped with a vapour phase permeable wrapper.
4. A smoking article according to Claim 1, wherein said vapour phase absorbing material is physically separated from said tobacco smoke filtration material.
5. A smoking article according to Claim 1, wherein said vapour phase absorbing material is enclosed in an encapsulating material which is impermeable to the particulate phase of tobacco smoke to form a capsule.
6. A smoking article according to Claim 5, wherein said capsule extends coaxially along the length of said filter element, the ends of the capsule being impermeable to the particulate phase of tobacco smoke.
7. A smoking article according to any one of the preceding claims, wherein the pressure drop of the filtration material tobacco smoke flow path is less than the pressure drop of the grooves, recess(es) or capsule containing the vapour phase absorbing material.
8. A smoking article according to any one of Claims 1 to 7, wherein the absorbing material is one or more of activated carbon, carbon, silica, zeolites, attapulgite clay, high surface area chalk, magnesium hydroxide or a synthetic high surface area absorbing material.
9. A smoking article according to Claim 1, wherein the channelling of the smoke is produced by introducing ventilating air into the upstream end of said filter element.
10. A method of deodorising smoked filter butts, the method comprising providing in a smoking article a tobacco smoke filter element and a wrapped rod of tobacco filler material interconnected by a tipping wrapper, said filter element comprising absorbing material for absorbing vapour phase constituents of smoke, a tobacco smoke flow path, the tobacco smoke being substantially confined to said tobacco smoke flow path separate from said absorbing material either by providing ventilation means to channel the smoke away from said vapour phase absorbing material when vapour phase absorbing material is held on or in a plugwrap material enwrapping filtration material, or by providing a physical barrier for particulate tobacco smoke between said tobacco smoke and said vapour phase absorbing material, said physical barrier being either a vapour phase permeable wrapper, a barrier disc coaxially arranged at the tobacco end of a core of vapour phase absorbing material, an encapsulating material having a vapour

permeable region, or a combination of a vapour phase permeable wrapper and a barrier disc coaxially arranged at the tobacco end of a core of vapour phase absorbing material, said absorbing material removing vapour phase constituents from said tobacco smoke by diffusion of vapour phase constituents from said tobacco smoke into said absorbing material.

11. Use of a smoking article comprising a tobacco smoke filter element and a wrapped rod of tobacco filler material interconnected by a tipping wrapper, for deodorising the smoked butt of said smoking article, the filter element comprising absorbing material for absorbing vapour phase constituents of smoke, a tobacco smoke flow path comprising fibrous filtration material, the tobacco smoke being substantially confined to said tobacco smoke flow path separate from said absorbing material by providing ventilation means to channel the smoke away from said vapour phase absorbing material said vapour phase absorbing material being held on or in a plugwrap material enwrapping said filtration material, said absorbing material removing vapour phase constituents from said tobacco smoke by diffusion of vapour phase constituents from said tobacco smoke into said absorbing material, and said absorbing material exhibiting the further technical effect of being capable, even after smoking has finished, of absorbing vapour phases emanating from odorous compounds found within the smoked filter element, thereby deodorising the smoked butt of said smoking article.
12. Use of a smoking article according to Claim 11, wherein the absorbing material is one or more of activated carbon, carbon, silica, zeolites, attapulgite clay, high surface area chalk, magnesium hydroxide or a synthetic high surface area absorbing material.
13. Use of a smoking article according to Claims 10 or 11, wherein said vapour phase absorbing material is adhered annularly on or in said plugwrap material about said tobacco smoke path.
14. Use of a smoking article according to Claim 13, wherein said absorbing material is adhered to plugwrap material at longitudinally spaced locations.

Patentansprüche

1. Rauchartikel mit einem Tabakrauch-Filterelement und einem umhüllten Strang aus Tabak-Füllmaterial, die durch ein Belagpapier verbunden sind, wobei das Filterelement absorbierendes Material zum Absorbieren der Dampfphasen-Bestandteile des Rauches aufweist, weiterhin mit einem Strömungspfad für den Tabakrauch, der im Wesentlichen auf den Strömungspfad des Tabakrauches begrenzt ist, getrennt von dem absorbierenden Material entweder durch Vorsehen einer Ventilationsanordnung, um den Tabakrauch von dem die Dampfphase absorbierenden Material weg zu kanalisieren, das sich in Nuten bzw. Rillen in dem Filtermaterial befindet, die sich in Längsrichtung längs der Oberfläche des Filterelementes erstrecken, oder einer oder mehrerer Aussparungen, die in dem Filterelement als Kern, um den das Filtrationsmaterial vorgesehen ist, angeordnet ist, wobei das Filtermaterial einen Tabakrauch-Strömungspfad zur Verfügung stellt, oder durch Vorsehen einer physikalischen Sperre für den partikelförmigen Tabakrauch zwischen dem Tabakrauch und dem die Dampfphase absorbierenden Material, wobei die physikalische Sperre entweder eine für die Dampfphase durchlässige Umhüllung, eine Sperrscheibe, die koaxial an dem Tabakende eines Kerns des die Dampfphase absorbierenden Materials, ein eingekapseltes Material mit einem dampfdurchlässigen Bereich oder eine Kombination aus einem für die Dampfphase durchlässigen Umhüllung und einer Sperrscheibe ist, die koaxial an dem Tabakende eines Kerns des die Dampfphase absorbierenden Materials angeordnet ist, wobei das absorbierende Material die Dampfphasen-Bestandteile aus dem Tabakrauch durch Diffusion der Dampfphasen-Bestandteile aus dem Tabakrauch in das absorbierende Material entfernt und das absorbierende Material den weiteren technischen Effekt zeigt, dass es in der Lage ist, sogar nach der Beendigung des Rauchens die Dampfphasen zu absorbieren, die von den unangenehm riechenden Verbindungen ausgehen, die sich in dem abgerauchten Filterelement finden, wodurch der abgerauchte Stummel des Rauchartikels desodoriert wird.
2. Rauchartikel nach Anspruch 1, wobei der Tabakrauch-Strömungspfad ein faser- bzw. fadenförmiges Filtrationsmaterial aufweist.
3. Rauchartikel nach Anspruch 1, wobei der Kern des die Dampfphase absorbierenden Materials mit einem für die Dampfphase durchlässigen Umhüllung umgeben ist.
4. Rauchartikel nach Anspruch 1, wobei das die Dampfphase absorbierende Material physikalisch von dem Tabak-

rauch-Filtrationsmaterial getrennt ist.

- 5 5. Rauchartikel nach Anspruch 1, wobei das die Dampfphase absorbierende Material in ein Einkapselungsmaterial eingeschlossen ist, das für die Partikelphase des Tabakrauchs undurchlässig ist, um eine Kapsel zu bilden.
6. Rauchartikel nach Anspruch 5, wobei sich die Kapsel koaxial längs der Länge des Filterelementes erstreckt, wobei die Enden der Kapsel undurchlässig für die Partikelphase des Tabakrauchs sind.
- 10 7. Rauchartikel nach einem der vorhergehenden Ansprüche, wobei der Druckabfall des Filtrationsmaterial-Tabakrauch-Strömungspfad kleiner als der Druckabfall der Nuten, der Aussparung(en) oder der Kapsel ist, die das die Dampfphase absorbierende Material enthalten.
- 15 8. Rauchartikel nach einem der Ansprüche 1 bis 7, wobei das absorbierende Material eins oder mehrere von Aktivkohle, Kohlenstoff bzw. Graphit bzw. Kohle, Siliziumdioxid, Zeolite, Attapulgit-Ton, Kalk mit hoher spezifischer Oberfläche, Magnesiumhydroxid oder ein synthetisches absorbierendes Material mit hoher spezifischer Oberfläche ist.
- 20 9. Rauchartikel nach Anspruch 1, wobei die Kanalführung des Rauches durch Einführung von Ventilationsluft in das stromaufwärts liegende Ende des Filterelementes erzeugt wird.
- 25 10. Verfahren zum Desodorieren von gerauchten Filterstummeln mit: Vorsehen eines Tabakrauch-Filterelementes und eines umhüllten Strangs aus Tabak-Füllmaterial, die durch ein Belagpapier verbunden sind, in einem Rauchartikel, wobei das Filterelement ein absorbierendes Material zum Absorbieren der Dampfphasen-Bestandteile des Rauches aufweist, weiterhin mit einem Tabakrauch-Strömungspfad, wobei der Tabakrauch im Wesentlichen auf den Tabakrauch-Strömungspfad getrennt von dem absorbierenden Material entweder durch Vorsehen einer Ventilationsanordnung, um den Rauch weg von dem die Dampfphase absorbierenden Material zu kanalisieren, wenn das die Dampfphase absorbierende Material auf oder in einem Filterumhüllungsmaterial gehalten wird, das das Filtrationsmaterial umhüllt, oder durch Vorsehen einer physikalischen Sperre für den partikelförmigen Tabakrauch zwischen dem Tabakrauch und dem die Dampfphase absorbierenden Material begrenzt wird, wobei die physikalische Sperre entweder eine für die Dampfphase durchlässige Umhüllung, eine Sperrscheibe, die koaxial an dem Tabakende eines Kerns eines die Dampfphase absorbierenden Materials angeordnet ist, ein Einkapselungsmaterial mit einem dampfdurchlässigen Bereich, oder eine Kombination aus einer für die Dampfphase durchlässigen Umhüllung und einer Sperrscheibe ist, die koaxial an dem Tabakende eines Kerns des die Dampfphase absorbierenden Materials angeordnet ist, wobei das absorbierende Material die Dampfphasen-Bestandteile aus dem Tabakrauch durch Diffusion der Dampfphasen-Bestandteile aus dem Tabakrauch in das absorbierende Material entfernt.
- 30 35 11. Verwendung eines rauchbaren Artikels mit einem Tabakrauch-Filterelement und einem umhüllten Strang aus Tabakfüllmaterial, die durch ein Belagpapier verbunden sind, zum Desodorieren des gebrauchten Stummels des Rauchartikels, wobei das Filterelement absorbierendes Material für die Absorption der Dampfphasen-Bestandteile des Rauches aufweist und wobei der Tabakrauch-Strömungspfad ein faden- bzw. faserförmiges Filtrationsmaterial aufweist und der Tabakrauch im Wesentlichen auf den Tabakrauch-Strömungspfad getrennt von dem absorbierenden Material durch Vorsehen einer Ventilationsanordnung begrenzt wird, um den Rauch weg von dem die Dampfphase absorbierenden Material zu kanalisieren, wobei das die Dampfphase absorbierende Material auf oder in einem Filterumhüllungsmaterial gehalten ist, das das Filtrationsmaterial umhüllt, wobei das absorbierende Material die Dampfphasen-Bestandteile aus dem Tabakrauch durch Diffusion der Dampfphasen-Bestandteile aus dem Tabakrauch in das absorbierende Material entfernt und wobei das absorbierende Material den weiteren technischen Effekt zeigt, in der Lage zu sein, sogar nach der Beendigung des Rauchens die Dampfphasen zu absorbieren, die von den übel riechenden Verbindungen ausgehen, die sich in dem gerauchten Filterelement befinden, wodurch der gerauchte Stummel des Rauchartikels desodoriert wird.
- 40 45 50 12. Verwendung eines Rauchartikels nach Anspruch 11, wobei das absorbierende Material eins oder mehr aus Aktivkohle, Kohle bzw. Kohlenstoff bzw. Graphit, Siliziumdioxid, Zeolite, Attapulgit-Ton, Kalk mit hoher spezifischer Oberfläche, Magnesiumhydroxid oder ein synthetisches absorbierendes Material mit hoher spezifischer Oberfläche ist.
- 55 13. Verwendung eines Rauchartikels nach Anspruch 10 oder 11, wobei das die Dampfphase absorbierende Material ringförmig auf oder in das Filterumhüllungsmaterial um den Tabakrauch-Pfad geklebt ist.

14. Verwendung eines Rauchartikels nach Anspruch 13, wobei das absorbierende Material auf das Filterumhüllungs-material an in Längsrichtung im Abstand angeordneten Stellen geklebt ist.

Revendications

1. Article à fumer comprenant un élément filtrant la fumée de tabac et une tige roulée dans du papier et remplie d'une charge de tabac, qui sont reliés l'un à l'autre par un machon de liaison de bout-filtre, l'élément filtrant comprenant une matière absorbante pour absorber les constituants en phase vapeur de la fumée, une voie d'écoulement de la fumée de tabac, la fumée de tabac étant essentiellement confinée dans ladite voie d'écoulement et séparée de ladite matière absorbante soit en prévoyant un moyen de ventilation pour canaliser la fumée à l'écart de ladite matière absorbant la phase vapeur placée dans des rainures formées dans le matériau de filtration, les rainures s'étendant longitudinalement le long de la surface dudit élément filtrant, ou dans un ou des évidements disposés à l'intérieur dudit élément filtrant en tant que noyau, autour duquel est disposé un matériau de filtration, ledit matériau de filtration fournissant une voie d'écoulement de la fumée de tabac, soit en prévoyant une barrière physique pour la fumée de tabac particulaire entre ladite fumée de tabac et ladite matière absorbant la phase vapeur, ladite barrière physique étant soit un matériau d'enveloppe perméable à la phase vapeur, un disque de séparation disposé coaxialement à l'extrémité côté tabac d'un noyau en matière absorbant la phase vapeur, un matériau encapsulé comportant une zone perméable à la vapeur, soit une combinaison d'un matériau d'enveloppe perméable à la phase vapeur et d'un disque de séparation disposé coaxialement à l'extrémité côté tabac du noyau en matière absorbant la phase vapeur, ladite matière absorbante éliminant les constituants en phase vapeur de ladite fumée de tabac par diffusion des constituants en phase vapeur par ladite fumée de tabac jusque dans ladite matière absorbante, et ladite matière absorbante présentant l'effet technique supplémentaire d'être capable, même après que le fumage ait cessé, d'absorber les phases vapeur émanant de composés odorants trouvés à l'intérieur de l'élément filtrant enfumé, désodorisant par là même le mégot fumé dudit article à fumer.
2. Article à fumer selon la revendication 1, dans lequel ladite voie d'écoulement de la fumée de tabac comprend un matériau de filtration fibreux.
3. Article à fumer selon la revendication 1, dans lequel ledit noyau en matière absorbant la phase vapeur est entouré d'un matériau d'enveloppe perméable à la phase vapeur.
4. Article à fumer selon la revendication 1, dans lequel ladite matière absorbant la phase vapeur est séparée physiquement dudit matériau de filtration de la fumée de tabac.
5. Article à fumer selon la revendication 1, dans lequel ladite matière absorbant la phase vapeur est enfermée dans un matériau encapsulant qui est imperméable à la phase particulaire de la fumée de tabac pour former une capsule.
6. Article à fumer selon la revendication 5, dans lequel ladite capsule s'étend coaxialement le long dudit élément filtrant, les extrémités de la capsule étant imperméables à la phase particulaire de la fumée de tabac.
7. Article à fumer selon l'une quelconque des revendications précédentes, dans lequel la chute de pression dans la voie d'écoulement de la fumée de tabac constituée par le matériau de filtration est inférieure à la chute de pression dans les rainures, dans le ou les évidement(s) ou dans la capsule contenant la matière absorbant la phase vapeur.
8. Article à fumer selon l'une quelconque des revendications 1 à 7, dans lequel la matière absorbante est constituée par l'une ou plusieurs des matières comprenant le charbon actif, le carbone, la silice, les zéolites, l'atapulgit, la craie à grande surface spécifique, l'hydroxyde de magnésium ou une matière absorbante synthétique à grande surface spécifique.
9. Article à fumer selon la revendication 1, dans lequel la fumée est canalisée en introduisant de l'air de ventilation dans l'extrémité amont dudit élément filtrant.
10. Procédé de désodorisation de mégots de cigarettes-filtres fumées, le procédé consistant à prévoir dans un article à fumer, un élément filtrant la fumée de tabac et une tige roulée dans du papier et remplie d'une charge de tabac, qui sont reliés l'un à l'autre par un manchon de liaison de bout-filtre, ledit élément filtrant comprenant une matière absorbante pour absorber les constituants en phase vapeur de la fumée, une voie d'écoulement de la fumée de tabac, la fumée de tabac étant essentiellement confinée dans ladite voie d'écoulement et séparée de ladite matière

absorbante soit en prévoyant un moyen de ventilation pour canaliser la fumée à l'écart de ladite matière absorbant la phase vapeur lorsque la matière absorbant la phase vapeur est maintenue sur ou dans un matériau d'enveloppe pour filtre enveloppant un matériau de filtration, soit en prévoyant une barrière physique pour la fumée de tabac particulaire entre ladite fumée de tabac et ladite matière absorbant la phase vapeur, ladite barrière physique étant soit un matériau d'enveloppe perméable à la phase vapeur, un disque de séparation disposé coaxialement à l'extrémité côté tabac d'un noyau en matière absorbant la phase vapeur, un matériau encapsulant comportant une zone perméable à la vapeur, ou une combinaison d'un matériau d'enveloppe perméable à la phase vapeur et d'un disque de séparation disposé coaxialement à l'extrémité côté tabac du noyau en une matière absorbant la phase vapeur, ladite matière absorbante éliminant les constituants en phase vapeur de ladite fumée de tabac par diffusion des constituants en phase vapeur depuis ladite fumée de tabac jusque dans ladite matière absorbante.

11. Utilisation d'un article à fumer comprenant un élément filtrant la fumée de tabac et une tige roulée dans du papier et remplie d'une charge de tabac, qui sont reliés l'un à l'autre par un manchon de liaison de bout-filtre, pour désodoriser le mégot fumé dudit article à fumer, l'élément filtrant comprenant une matière absorbante pour absorber les constituants en phase vapeur de la fumée, une voie d'écoulement de la fumée de tabac comprenant un matériau de filtration fibreux, la fumée de tabac étant essentiellement confinée dans ladite voie d'écoulement et séparée de ladite matière absorbante en prévoyant un moyen de ventilation pour canaliser la fumée à l'écart de ladite matière absorbant la phase vapeur, ladite matière absorbant la phase vapeur étant maintenue sur ou dans un matériau d'enveloppe pour filtre enveloppant ledit matériau de filtration, ladite matière absorbante éliminant les constituants en phase vapeur de ladite fumée de tabac par diffusion des constituants en phase vapeur depuis ladite fumée de tabac jusque dans ladite matière absorbante, et ladite matière absorbante présentant l'effet technique supplémentaire d'être capable, même après que le fumage soit terminé, d'absorber les phases vapeur émanant de composés odorants trouvés à l'intérieur de l'élément filtrant enfumé, désodorisant par là même le mégot fumé dudit article à fumer.

12. Utilisation d'un article à fumer selon la revendication 11, dans laquelle la matière absorbante est l'une ou plusieurs des matières comprenant le charbon actif, le carbone, la silice, les zéolites, l'atapulgit, la craie à grande surface spécifique, l'hydroxyde de magnésium ou une matière absorbante synthétique à grande surface spécifique.

13. Utilisation d'un article à fumer selon les revendications 10 ou 11, dans laquelle ladite matière absorbant la phase vapeur adhère annulairement sur ou dans ledit matériau d'enveloppe pour filtre autour de ladite voie d'écoulement de la fumée de tabac.

14. Utilisation d'un article à fumer selon la revendication 13, dans laquelle ladite matière absorbante adhère au matériau d'enveloppe pour filtre à des endroits espacés longitudinalement.

Fig.1.

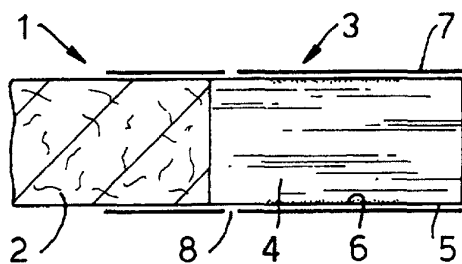


Fig.2.

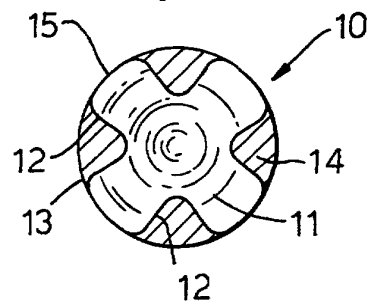


Fig.3.

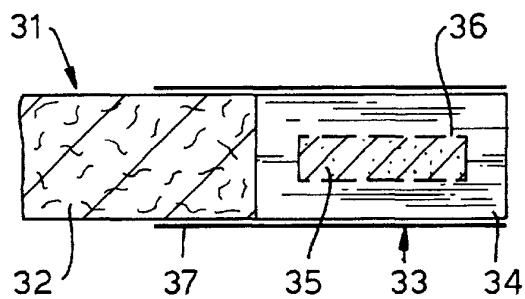


Fig.4.

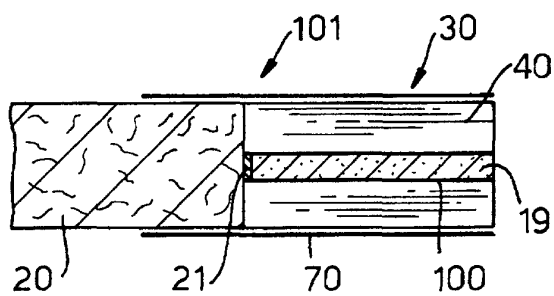


Fig.5.

