

J. R. M.



Industria y Comercio

SUPERINTENDENCIA

Delegatura de Propiedad Industrial

División de Nuevas Creaciones

PCT
SOLICITUD

PATENTE DE INVENCION

04-57551

21. EXPEDIENTE No.

54. TITULO "PETRÓLEO PARA FUMAR VENTILADO."

51. CLASIFICACION INTERNACIONAL

A24D 3/04

71. SOLICITANTE BRITISH AMERICAN TOBACCO (INVESTMENTS) LIMITED.

DOMICILIO LONDRES. GRAN BRETAÑA

74. APODERADO FLUARO CORREA OROREZ
T.P. 20.281

22. BOGOTA, D.C., JUNIO 18 DE 2004.

Industria y Comercio
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SUPERINTENDENCIA Y COMERCIO
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Dependencia: 2020 DIVISION DE NUEVAS CREACIONES

FORMULARIO ÚNICO DE SOLICITUD DE PATENTE
PCT
ENTRADA EN FASE NACIONAL

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SOLICITUD DE :

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Patente de Invención

☐

Patente de Modelo de Utilidad

☐

Capítulo I.

☒

Capítulo II.

②

SOLICITANTE

(71)

Nombre: BRITISH AMERICAN TOBACCO (INVESTMENTS)
LIMITED.Dirección: Globe House, 1 Water Street, London WC2R 3LA,
Gran Bretaña

Nacionalidad o Domicilio: GRAN BRETAÑA

Lugar de Constitución: GRAN BRETAÑA

Teléfono:

Fax:

E-Mail

IDENTIFICACION

C.C.

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C.E.

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Otro

☐

Cual

Número

③

REPRESENTANTE
O APODERADO

Nombre: ALVARO CORREA ORDOÑEZ

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E-Mail: patents.bogota@bakernet.com

IDENTIFICACION

C.C.

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C.E.

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Otro

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Cual

Número

79.143.366 de

Usaquén

TP 20.281

④

INVENTOR (ES)
(72)

Nombre: VER ANEXO

Dirección: VER ANEXO

Nacionalidad o Domicilio: VER ANEXO

⑤

PCT (85)

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⑥

Título (54)

ARTÍCULO PARA FUMAR VENTILADO.

⑦

Clasificación Internacional (51)

A24D 3/04

⑧

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SI

☒

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☐

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01129382.6

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Comprobante de pago No. 04-27,077

Fecha ABRIL 2 DE 2004

Instrucciones para el diligenciamiento del presente formulario, ver reverso de esta página

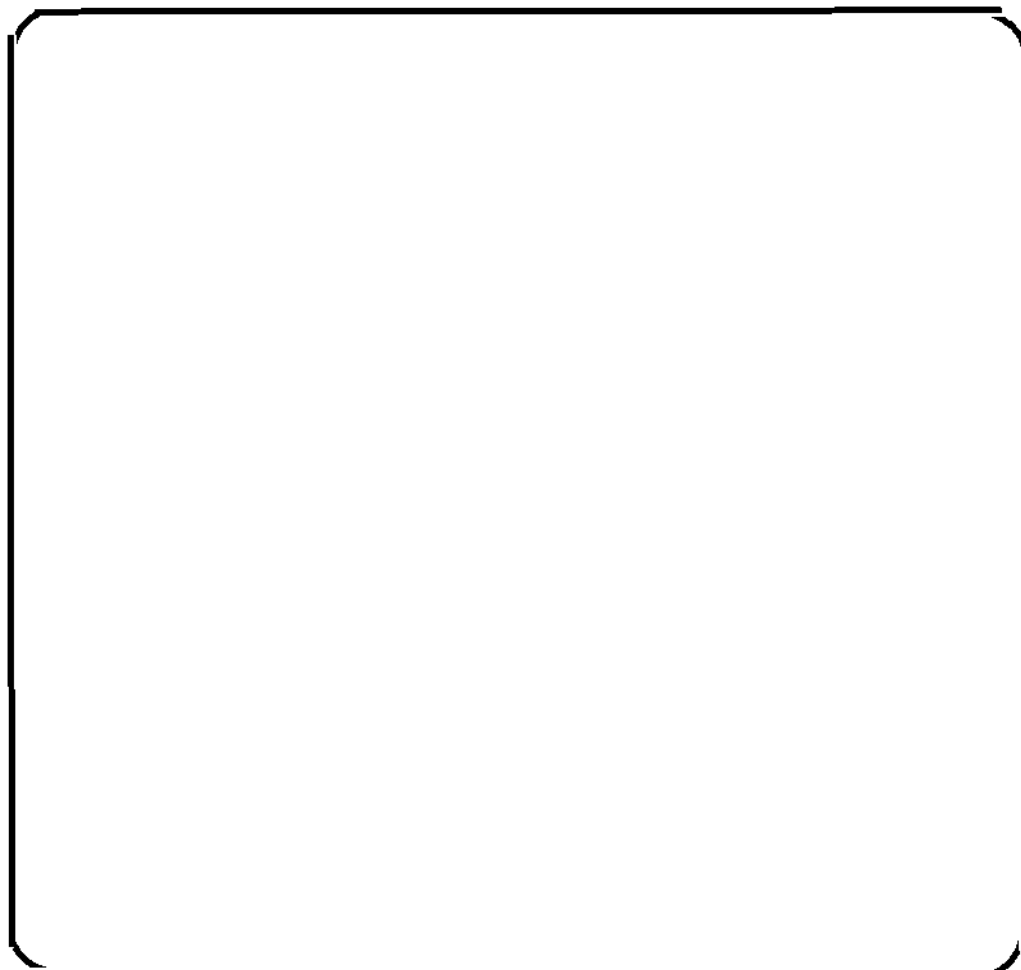
10

ANEXOS

- ☒ Comprobante de pago de la tasa de presentación de la solicitud
- ☐ Documento que acredite la existencia y representación legal cuando el solicitante sea persona jurídica
- ☒ Poderes, si fuere el caso
- ☐ Documento de cesión del inventor al solicitante o a su causante
- ☐ Declaraciones
- ☒ Copia de la solicitud internacional. (Resumen, descripción, reivindicaciones, dibujos)
- ☒ Traducción de la solicitud internacional al castellano. (Resumen, descripción, reivindicaciones, dibujos)
- ☒ Copia del examen preliminar internacional efectuado por la Autoridad Internacional de Examen preliminar (IPEA)
- ☐ Traducción del examen preliminar internacional efectuado por la IPEA
- ☐ De ser el caso, copia del contrato de acceso
- ☐ De ser el caso, documento que acredite la licencia o autorización de uso de conocimientos tradicionales de las comunidades indígenas
- ☐ De ser el caso, certificado de depósito del material biológico
- ☒ Arte final 12 x 12
- ☐ De ser el caso, información sobre otras solicitudes de patente o títulos obtenidos en el extranjero por el mismo titular o su causante, relacionadas parcial o totalmente con la invención de esta solicitud
- ☐ De ser el caso, modificaciones efectuadas a la solicitud internacional.
- ☐ Otros:

11

FIGURA CARACTERÍSTICA



12

Solicito la concesión de la patente.

NOMBRE: ALVARO CORREA ORDOÑEZ

FIRMA:

C.C. 79.143.366 de
Usaquén

T.P. 20.261

SUPERINDUSTRIA Y COMERCIO
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 Dependencia: 2020 DIVISION DE NUEVAS CREACIONES
 NIT : 000176089-2

RECIBO OFICIAL DE CAJA : 04 - 27,077
 FECHA : ABRIL 2 DE 2004

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vr. PAGO
ALVARO CORREA ORDOÑEZ	CONSIGNACION	BANCO POPULAR	050-00110-6	20351067	02/04/2004	137,305,000.00

***** CONCEPTO *****

CANT. RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1 50005-01-01 SOLICITUDES	1 TRAMITES DE SOL. DE PATENTE DE IN	422,000.00
	TOTAL :	422,000.00

SOM: CUATROCIENTOS VEINTIDOS MIL PESOS

RESPONSABLE : 

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

ANEXO - INVENTORES

TITULO: ARTÍCULO PARA FUMAR VENTILADO.

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Señores

SUPERINTENDENCIA DE INDUSTRIA Y COMERCIO
DIVISION DE NUEVAS CREACIONES

E. _____ S. _____ D. _____

Ref.: Nueva Solicitud de Patente Titulada:

"ARTÍCULO PARA FUMAR VENTILADO."

Solicitante: BRITISH AMERICAN TOBACCO
(INVESTMENTS) LIMITED.

SUSTITUCIÓN DE PODER

CARLOS R. OLARTE, mayor y vecino de Bogotá. D.C., identificado como aparece al pie de mi firma, actuando en mi carácter de apoderado de la sociedad de la referencia, respetuosamente me permito manifestar que **SUSTITUYO** el poder a mi conferido por la mencionada sociedad en el doctor **ALVARO CORREA ORDONEZ**, identificado con la Cédula de Ciudadanía número 79.143.366 de Usaquén y con la Tarjeta Profesional número 20.281, para que sea él quien en adelante, asuma el trámite de la presente solicitud.

El apoderado sustituto queda con las mismas facultades del principal.

Atentamente,



CARLOS R OLARTE
C.C. No. 79.782.747 de Bogotá
T. P. No. 74.295 del Consejo Superior de la Judicatura

**DILIGENCIA DE RECONOCIMIENTO
Y PRESENTACION PERSONAL**

Ante el Notario Once del Circulo de Santa Fe de
Bogotá, compareció

Quien exhibió la C.C. No. 7.676.274
expedida en T.P. 742

y declaró que la firma y huella que aparecen en
el presente memorial son auyas y que el conte-
nido del mismo es cierto.

Memorial dirigido a INTERCOM
25 SET 1985

Santa Fe de Bogotá, D.C.

Firma del Declarante

HUELLA

Autorizó la anterior Diligencia

NOTARIO ONCE DEL CIRCULO DE SANTA FE DE BOGOTÁ

REPUBLICA DE COLOMBIA

NOTARIA 11 DEL CIRCULO DE
BOGOTÁ, D.C.

XIMENA BAUTISTA NAVARRO
NOTARIA ONCE (E)



CONSULADO GENERAL DE COLOMBIA

3RD FLOOR, 15-19 GREAT TITCHFIELD STREET, LONDON W1P 7FB
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58
6

El suscrito Cónsul General de Colombia en Londres, vistos los documentos presentados ante este Despacho,

CERTIFICA

Que, **NIGEL MAURICE PUGH**, Notario Público de Southampton, Inglaterra, Gran Bretaña, legalizó la firma del documento precedente.

Que, **BRITISH AMERICAN TOBACCO (INVESTMENTS) LIMITED**, es una Sociedad constituida, organizada y existente en Londres, Inglaterra, y que cumple con su objeto social de acuerdo con las leyes de este país.

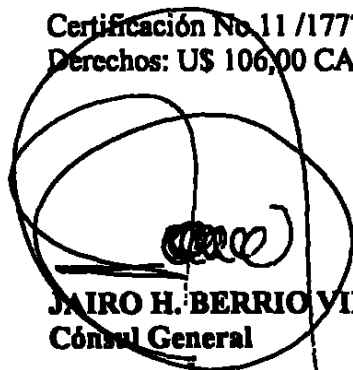
Que, **MARGOT RUTH WALFORD**, en su calidad de Secretaria Asistente de la mencionada Sociedad, debidamente autorizada otorga el documento precedente y su firma se encuentra legalizada por **NIGEL MAURICE PUGH**, Notario Público de Southampton, Inglaterra, Gran Bretaña.

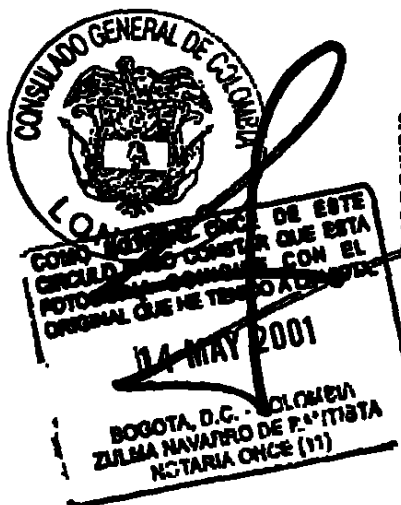
El Cónsul General no asume responsabilidad por el contenido del mencionado documento.

Dado en Londres, Inglaterra, Gran Bretaña, a los veinticuatro (24) días del mes de Noviembre de dos mil (2000).

Certificación No. 11 /1777

Derechos: US \$ 106,00 CANCELADOS


JAIRO H. BERRIO VILLARREAL
Cónsul General



MINISTERIO DE RELACIONES
EXTERIORES
8 0 1 0 8 5
Firma de Jairo H. Berrio Villarreal
Firma legalizada en el
documento precedente
las funciones indicadas

NO SE ASUME
RESPONSABILIDAD DEL TEXTO.
2000 DEC 13 A 9 22
JEFE DE LEGALIZACIONES
SANTAFE DE BOGOTA A.C.

BAKER & MCKENZIE

ATTORNEYS AT LAW

APARTADO AEREO 3746

TELEFONO: 265-1400

SANTAFE DE BOGOTA, D.C.

COLOMBIA

POWER OF ATTORNEY

The undersigned.

**BRITISH AMERICAN TOBACCO (INVESTMENTS)
LIMITED**

located in **Globe House, 1 Water Street, WC2R 3LA**

LONDON, UNITED KINGDOM

declares that it hereby grants to

CARLOS REINALDO OLARTE

a full and sufficient power of attorney to apply to the proper national officers and authorities for the issue of:

Patents of Invention, Patents for Utility Models, mergers, changes of name, assignments, filing and prosecution of oppositions, changes of address

to which end it empowers them to take all steps necessary before said authorities for the objects stated, to file petitions, prepare descriptions, make protests, declarations, appeals and objections, pay imposts, apply for certifications, receive documents and securities, abandon applications and collect refunds. To the said mandatories sufficient power is granted hereby to receive notifications for and on behalf of the Company, to confer powers on those who are to represent the company judicially and extrajudicially, to answer in court in the matter of all claims and demands that may be presented in connection with the patents, and to do everything that may be required, before administrative or judicial officers of any class giving them likewise power to substitute these presents and revoke such substitutions if necessary.

Done and subscribed in **Southampton, U.K.**

On the **21st** day of **November 2000**

MARGOT RUTH WALFORD
Assistant Secretary

*Signed by MARGOT RUTH WALFORD an
authorised signatory, and Reinaldo Olarte*

NIGEL MAURICE PUGH

Notary Public
22 Kings Park Road
Southampton SO15 2UF
United Kingdom

PODER

La abajo firmada.

**BRITISH AMERICAN TOBACCO (INVESTMENTS)
LIMITED**

domiciliada en **Globe House, 1 Water Street, WC2R 3LA**

LONDRES, REINO UNIDO

declara por el presente otorgar a

CARLOS REINALDO OLARTE

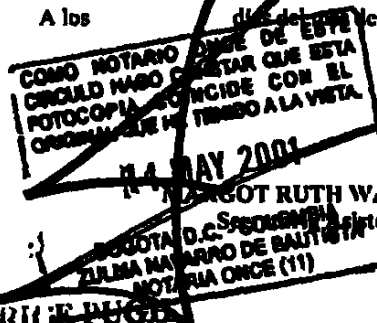
poder especial amplio y bastante para recabar de las oficinas y autoridades nacionales que correspondan, la obtención de:

Patentes de Invencción, Patentes de Modelo de Utilidad, fusiones, cambios de nombre, cesiones, presentación y trámite de oposiciones, cambios de dirección

a cuyo efecto los faculta para dar ante dichas autoridades, todos los pasos necesarios al objeto indicado, elevar solicitudes, formular descripciones, protestas, declaraciones, apelaciones y reclamos, oblar impuestos, solicitar testimonios, recibir documentos y valores, desistir y percibir. Se concede a los expresados mandatarios poder bastante para recibir notificaciones a nombre de la compañía, otorgar poderes a quienes vayan a representar a la compañía judicial y extrajudicialmente, responder en juicio a todas las reclamaciones o demandas que por motivo de las patentes se presentaren y hacer cuanto fuere necesario, ante las autoridades administrativas o judiciales de cualquier orden, dándoles asimismo facultad para sustituir el presente y en caso necesario revocar dichas sustituciones.

Dado y firmado en

A los



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01129382.6 18 December 2001 (18.12.2001) HP ✓

(71) Applicant (for all designated States except US): BRITISH AMERICAN TOBACCO (INVESTMENTS) LIMITED (GB/GB); Globe House, 1 Water Street, London WC2R 3LA (GB). ✓

(72) Inventors; and
(75) Inventors/Applicants (for US only): SCHLÜTER, Adolf [DE/DE]; Bühlstrasse 26, 95448 Eckersdorf (DE). GR-ZONKA, Horst [DE/DE]; Brauergasse 1, (Obernössen), 95490 Mitzelgan (DE). ✓

(74) Agent: WALFORD, Margot, Ruth; Patents Department, British American Tobacco R & D Centre, Regents Park Road, Southampton SO15 8TL (GB).

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU,

CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

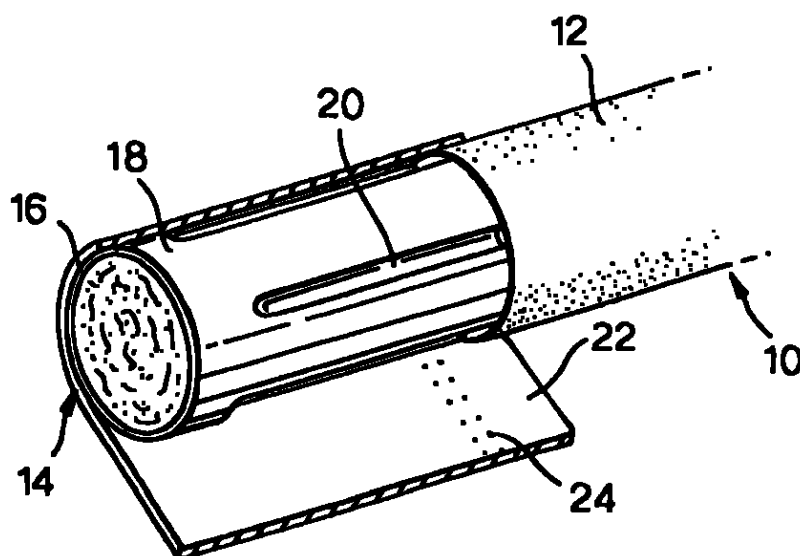
(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TO).

Declarations under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(1)) for the following designations AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB,

[Continued on next page]

(54) Title: VENTILATED SMOKING ARTICLE



(57) Abstract: The invention concerns a smoking article filter plug (16) for a cigarette, the filter plug being cylindrical and having a plug wrap (18), grooves (20) being impressed into the plug wrap, and a tipping paper (22) for the attachment of the filter plug to the tobacco rod (12). Some grooves are axially extending with respect to the axis of the filter plug and are open on the side of the tobacco rod and extend continuously only over a part of the length of the filter plug. All grooves are covered by a ventilated tipping paper, which allows ventilating air into the axially extending grooves only. In addition the invention concerns the use of such a filter for the reduction of the CO/har ratio as a

function of the filter ventilation.

WO 03/051144 A1

WO 03/051144 A1



- GR, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG)*

 - *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii)) for all designations of inventorship (Rule 4.17(iv)) for US only*

Published:

 - *with international search report*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Various forms of embodiment of such filters are known. Thus US 4,406,294 discloses a cigarette filter with a cylindrical filter plug, with an air-permeable plug wrap for the filter plug and with grooves impressed into the circumference of the filter plug extending over a part of the filter length from the mouth end of the filter. The grooves are, however, impermeable. The cylindrical filter plug and hence also the grooves are attached by an air-permeable tipping paper provided with ventilation openings. The filter has an uncomplicated structure and achieves an essentially normal drop in pressure over the cigarette.

US 4,649,943 shows a further modification of such a filter, in which the grooves are open at the mouth end of the filter. In addition, at least one perforation is provided in the area of the grooves intended for the introduction of air through the plug wrap into the filter plug, thereby providing the filter with an improved air distribution in the filter rod. In addition a tipping wrapper of impermeable material which has an air-permeable region contributes to this. The lining paper (plug wrap) is impermeable but provided with ventilation openings.

US 4,362,171 discloses a cigarette filter with grooves which are open neither at the tobacco end nor at the mouth end and thus extend only over the centre of the filter plug. Each groove is provided with an opening, so that ventilation air is guided longitudinally along the filter rod in the direction of the mouth end. Thus outside air is introduced at high velocity in a

simple manner into the cigarette filter, without the danger of a blockage due to lip pressure and/or a loss of pressure.

US 4,343,319 discloses a similar cigarette filter with a smoke-impermeable wrapper for the filter plug and with a central tube, extending axially through the filter plug, which is located in flow connection with the opening in the grooves. In this way the smoke leaving the tobacco rod is divided into two parts. One part flows through the central pipe and the other part flows through the filter material. The presence of tubes and interconnecting passages adds to the complexity of the filter manufacture.

Further, a cigarette filter with an air-impermeable wrapper for the filter core and with grooves in the circumference of the filter core and which extend over the whole length of the filter core is disclosed in DE 30 48 905 A1. This filter can be manufactured more easily, since it is not necessary to change the production direction.

A filter for tobacco smoke provided with grooves in its circumference which are produced by a corrugated material around the actual filter is known from GB 2102271. The plug wrap surrounding the filtration material is smoke-impermeable. Grooves are provided between the plug wrap and the corrugated material, and also between the tipping wrapper and the corrugated material. The tipping wrapper is provided with ventilation openings. This filter element should be versatile and flexibly usable.

GB 2 089 641 A discloses a filter for a cigarette with a central, hollow tube, which extends from one end of the filter into the filter material. The filter core is surrounded by a non-porous wrapper and the filter plug and the wrapper have at least one groove, which extends longitudinally from one end of the filter plug. In this way a normal decrease of pressure through the cigarette is achieved for a filter with low to moderate efficiency. Formation of a hollow tube adds to the manufacturing requirements.

Further, GB 2 136 669 A shows a cigarette filter with a filter plug which is surrounded by a smoke-permeable material. The filter has longitudinal corrugations which form grooves outside of the smoke-permeable wrapper which are open at one end of the filter and extend in longitudinal direction from this end towards the other end but not over the entire length of the filter plug. The smoke permeable wrapper carries means, i.e. a coating, which makes it smoke-impermeable over a region which extends over only a part of the length of the grooves and separates from the corresponding end of the filter a grooved region of the wrapper which is smoke permeable.

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GB 2 095 093 A discloses a filter with a filter plug with a non-porous wrapper and with grooves which extend from one end of the filter a certain distance in the direction of the other end of the filter. The grooves can be open to the atmosphere and so aligned that they extend up to the mouth end of the filter or to the tobacco end of the filter. It is also possible to have an alternating arrangement of grooves which begin at the mouth end and at the tobacco end. The filter is fastened to the tobacco rod by a narrow strip of material in order to prevent disruption of the entry of the ventilation openings to the grooves.

US-A-3,752,165 shows a filter for a smokable article with a filter plug which is wrapped in a thin, porous wrapper paper. A plurality of grooves is formed in the wrapper paper and into the filter material at one end of the filter. The grooves extend from one end of the filter to a point shortly before the opposite end and are surrounded by a smoke-impermeable plug wrap. The grooves extend from one end of the filter to a point which is some distance from the other end. A high efficiency for the removal of the tar from the tobacco smoke with an acceptable decrease of pressure can be achieved with this filter.

Further, a filter is known from US-A-3,910,288 with a filter plug provided around its circumference with grooves which extend from the tobacco end of the filter up to a place before the mouth end of the filter. The grooves are formed in a rigid plastic wrapper which surrounds the filter material. At one end of every groove an opening is provided which makes a connection to the filter material possible. Filter ventilation is not provided.

This filter is very resistant to crushing, so that the and/or each groove can remain open during the entire smoking of the smokable article. By gradually changing the portion of the smoke which flows through the groove from a previously defined value to a value of 0, the filter achieves an almost homogeneous delivery of particulate material per puff with a relatively constant increase of the degree of efficiency of the filter.

Finally, US-A-3,596,663 shows a filter for a smokable article with a filter plug with grooves, the length of which is not defined. The filter wrapper and the lining paper are in each case porous and/or provided with perforations. The air-permeable wrapper is corrugated in order to increase the size of the air-permeable surface and thus to simplify the path of the air which is allowed through the ventilated wrapping paper to the filter material of the filter plug. Thus a ventilated filter is produced that significantly reduces the restriction of the air passage to the filtering medium.

It can thus be stated in summary that for many years cigarette filters have been provided with grooves which permit smoke and/or air to be directed differently as a function of the position and the length of the grooves and the porosity and/or ventilation of the tipping or filter-

wrapping paper. In this way it is possible to achieve a dilution of the smoke, turbulence of the smoke in the mouth area, and the separate guidance of ventilation air and smoke, as well as some other effects.

In recent years attention has been directed to one smoke component, i.e. carbon monoxide (CO), for which no effective, economical filter is yet known. Particularly in view of the new legal requirements which prescribe a maximum CO quantity in the tobacco smoke of a cigarette, attempts are being made to reduce the CO content of the smoke to below a given maximum value.

The object of the invention is to produce a filter for a smoking article, in particular a cigarette, which enables an effective, in particular adjustable, decrease of the CO content of the smoke compared with other components, such as tar and nicotine.

This is achieved in accordance with the invention by the features of Claim 1.

Appropriate embodiments are defined by the characteristics of the subordinate claims.

Due to the flow mechanics in the filter of this invention, the retention of the filter material is reduced because of the well known dependency of the linear flow velocity: retention decreases with increasing flow velocity. Due to the fact that the CO level is not affected by the filtering material, the CO/tar ratio decreases.

If an air-impermeable plug wrap is used with the filter in accordance with invention then the ventilating air flows over the grooves toward the tobacco rod when smoking the cigarette and from there back through the filtration material into the mouth of the smoker.

As an alternative it is possible to employ a plug wrap which is inherently porous or ventilated and hence provided with ventilation openings. Some of the ventilation air then flows through this path and hence through the permeable plug wrap into the filter and to the mouth of the smoker. This portion can be adjusted by appropriate adjustment of the inherent or artificial porosity of the plug wrap, by which means the pressure drop/smoking mechanics as well as the CO/tar ratio can also be influenced.

As a further alternative, porous or ventilated plastic sheets or foils may be used as plug wrap material.

The use of on-machine laser perforation of tipping paper and impermeable plugwrap is particularly useful for low delivery products with a tar delivery of less than 3mg, preferably less than 1mg. For such low delivery products it may be advantageous to provide two rows of ventilation holes, one row located above the axially extending grooves and another row located downstream of those holes. On-line machine perforation perforates both the plug wrap and the

filtration material underneath, allowing the ingress of ventilating air thereto. Thus, mixed ventilation occurs, i.e. through grooves and filtration material.

Synthetic or thermoformable plugwraps such as those described in British Patent Nos. 2058543, 2056841 or 2134365 may also be especially suitable as heat mouldable plug wrap for the present invention.

Experiments have shown that the CO/tar ratio attainable changes as a function of the filter ventilation, i.e. the CO/tar ratio is reduced by increasing the filter ventilation, providing a further correcting variable for the CO/tar ratio.

In a preferred embodiment two to ten grooves are provided, since the use of only one groove leads to a very asymmetrical distribution of the ventilation air in the smoke which could impair smoking enjoyment. More than ten grooves greatly complicate the production process and also hardly leave enough space for adequate flow cross-section of the individual grooves. Good results were achieved with four grooves.

The grooves have a V-shaped or preferably a U-shaped cross section, since this has manufacturing and rheological advantages.

By choosing the appropriate number of grooves, their appropriate depth, width and length it is possible to adjust the filter properties to the target properties of the cigarette to be produced.

All conventionally used filter materials may be employed as filter material where one or several of these materials can be used. Preferably a conventional filter tow of cellulose acetate is used. For hardening the filters, conventional techniques are used, for example adding triacetin or Tegda to the filter tow.

It is also possible to add additives, such as activated charcoal, zeolites, flavour-modifiers or an ion exchange resin, such as that known as Duolite (see US Patent Nos. 3,716,500 or 3,943,832) which is a porous particulate salt of a weakly basic anion exchange resin, to the filter in order to reduce other vapour phase constituents.

Preferably the filtration material is homogeneous. As used herein 'homogeneous' as applied to filtration material means there are no flow openings, tubes or other elements in the filtration material. A homogeneous filtration material may, though, be comprised of different filtration materials, such as in differing filtration sections, should the filter be a multiple filter. A homogeneous filtration material has benefits of simplicity in manufacture.

Preferably the additive is located in a region of the filter which does not have grooves. This prevents thermal decomposition of the additive upon moulding to produce the grooves.

In accordance with a preferred embodiment the grooves extend over less than 80% of the length of the filter, where good results were obtained with about 60%.

The depth of the grooves should be within the range 0.5 to 2 mm, preferably about 1 mm, where suitable flow volumes are achieved.

Taking this criterion into consideration the width of the grooves, measured at the circumference of the filter, should lie between 1 and 3 mm, preferentially between 1.5 and 2.5 mm.

The depth of the grooves along the rod axis may not necessarily be constant. It may for example increase towards the open end, the tobacco side of the filter. The grooves may also be non-linear, following for example a screwed or helical form around the filter.

In some cases it may be necessary that a further groove is added to the filter, which runs radially around the filter circumference. This groove shall connect the axial grooves. It is useful that this radial groove is located directly below the ventilation zone of the tipping paper, which enhances the ventilation effect. In cases of larger ventilation zones it may also be necessary to use two or more radial grooves.

The filter of this invention may obviously be included as part of a dual or triple filtering device.

The tipping paper serving to attach the filter to the tobacco rod may have a conventional structure, provided that it permits ventilation. This can be achieved either by use of a porous, therefore inherently air-permeable tipping paper or by producing ventilation openings by mechanical or electrostatic means or using laser beams.

In order that the invention may be clearly understood and readily carried into effect, reference will now be made, by way of example, to the following diagrammatic drawings, in which:

Figure 1 shows a perspective view of a filter attached to a tobacco rod with partly wrapped tipping paper,

Figure 2 shows a curve plotting of the CO/tar ratio as a function of the filter ventilation for a filter in accordance with the invention and a comparison filter,

Figure 3 shows an embodiment of a filter with particulate additive therein, and

Figure 4 shows another embodiment of a filter with particulate additive therein.

Figure 1 shows a perspective view of a part of a proposed filter cigarette generally indicated by the reference symbol 10 with a conventional tobacco rod 12 and a filter element 14 appended to one end of the tobacco rod 12. The filter element 14 consists of a cylindrical filter plug 16 of cellulose acetate tow as filtration material, which is homogeneously distributed over the entire volume of the filter plug 14. Thus, no flow openings, tubes or other means are

provided in the filter plug 16. As used herein 'homogeneous' as applied to filtration material means there are no flow openings, tubes or other elements in the filtration material. A homogeneous filtration material may, though, be comprised of different filtration materials, such as the differing filtration sections described below with respect to Figure 4, none of which incorporate flow openings, tubes, etc.

The filter plug 16 is covered with a plug wrap 18 which is air-impermeable, although in other embodiments (not shown) it can be inherently porous and/or provided with ventilation openings depending upon requirements, taking account particularly of the tobacco taste desired.

Grooves 20 are stamped into the circumference of the filter element 14, four grooves 20 in the embodiment shown, which are distributed symmetrically over the circumference of the filter element 14. The grooves 20 extend up to the tobacco rod end of the filter element 14, where they are open so that there is a flow connection between the grooves 20 and the tobacco rod 12.

The grooves 20 run over the circumference of the filter plug 16 in an axial direction and end at a rheologically adequate distance from the mouth end of the filter element 14 and hence at a distance at which neither air nor smoke from the grooves 20 can directly reach the mouth end of the filter element 14.

Investigations have shown that the axial length of the grooves 20 should be less than 80% of the length of the filter plug 14. About 60% is preferred.

The grooves 20 have a depth of approximately 1.5 mm and a U-shaped cross section and a width of approximately 2 mm at the circumference.

The filter element 14 is surrounded in the usual way by a tipping paper 22, which is provided in the embodiment shown with two circumferential parallel rows of ventilation holes 24. A larger or smaller number of rows of ventilation holes can also be provided or the tipping paper 22 can be inherently porous. It is only necessary to ensure that the porosity and/or the number and size of the ventilation openings 22 ensure the desired degree of ventilation.

For the arrangement of the plug wrap 18 there are in principle two possibilities, i.e. the use of an air-impermeable paper or an air-permeable paper. In the case of use of an air-impermeable paper as plug wrap 18, ventilation air flows through the ventilation openings 24 when smoking the cigarette into the grooves 20 and then from the grooves 20 toward tobacco rod, where the direction is reversed and the ventilation air then flows, together with the smoke from the tobacco rod 12, through the filter plug 16 into the smoker's mouth.

If the plug wrap is air-permeable, either inherently porous or provided with ventilation openings, then an adjustable portion of ventilation air flows by this flow path through the air-

permeable plug wrap into the filter and to the mouth of the smoker. This is in addition to the air flowing through the grooves 20. In this way the dilution of the smoke can be adjusted by air ventilation in two places, i.e. firstly by ventilation through the tipping paper 22 and along the grooves 20, and secondly by ventilation air which enters directly through the plug wrap 18 into the filter plug 16.

If necessary, further short grooves open only to the mouth side of the filter 14 can be impressed into the exterior surface of the tipping paper 22. These have no rheological function, since they are not connected with the ventilation zone 24, but only alert the smoker to the presence of grooves in the filter element 14.

Figure 2 shows a graph of the effect of the filter ventilation on the CO/tar ratio with a filter in accordance with the invention from conventional cellulose acetate filter tow, an air-impermeable plug wrap and four grooves 20 with the above dimensions, which are symmetrically distributed over the circumference of the filter plug 16 and which, commencing from the tobacco end, extend over 60% of the length of the filter element 14.

In experiments the ventilation of the filter element 14 was varied, namely from zero to a maximum ventilation degree of 70%. For products of 3mg or less it is necessary, in order to obtain the required ventilation level, to use additional on machine laser perforation, as well as pre-perforated tipping. This increased ventilation level also helps reduce cigarette pressure drop. The reduction in CO/tar ratio obtained is balanced with the level of ventilation used.

In Figure 2 the full circles indicate the measured values for a conventional filter made from monoacetate filter tow without grooves, while the squares describe the measured values for a filter element 14 in accordance with the invention with the structure and the same dimensions as the comparison filter described above.

One can recognise very well that the filter element 14 in accordance with the invention reduces the CO content of the smoke relative to the delivered tar and hence the CO/tar ratio from about 1.4 to about 0.7, while through ventilation alone, and hence without use of grooves, the CO/tar ratio can be lowered to only to about 1.12.

Thus the CO/tar ratio can be reduced to below the limit set by the new regulations with the filter element 14 in accordance with the invention by the appropriate selection of a suitable degree of ventilation for the tipping paper 22.

Additional investigations of cigarettes with filters according to this invention showed that these results were confirmed also for different tobacco blends in the tobacco section of the cigarette. In Tables 1-3 the results are shown for the tobacco column of three commercially available cigarettes to which the filter of this invention was added. The corresponding cigarettes

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with conventional filters gave tar levels of about 10mg, 6mg and 3mg respectively. The measurements were done following DIN and ISO standards.

The filters used for these measurements had the following parameters of the grooves: 4 grooves, 17 mm long, about 1.5 mm wide and 0.5-1 mm deep. The plug wrap was air impermeable and not additionally ventilated.

The findings show clearly that the filters of this invention (named EF) made it possible to produce cigarettes with comparable pressure drops to the cigarettes with standard filters (named SF) by adjusting the ventilation level, but with clearly reduced CO/tar ratios.

Table 1:

	SF	EF	EF	EF	EF	EF
Pressure drop filter in mm(H ₂ O)	72	76	76	74	73	72
Filter ventilation	22,6	0,0	12,0	51,8	57,2	62,1
tar in mg	10,25	12,4	11,7	8,8	7,2	5,7
CO in mg	11,21	13,3	12,1	6,7	4,5	2,9
Pressure drop cigarette in mm(H ₂ O)	117	137	121	104	93	93
CO/tar	1,09	1,07	1,03	0,76	0,63	0,51

Table 2:

	SF	EF	EF	EF	EF
Pressure drop filter in mm(H ₂ O)	108	90	89	91	89
Filter ventilation	43,0	0,0	50,6	58,3	69,1
tar in mg	5,6	11,4	7,8	6,1	4,3
CO in mg	6,7	13,1	5,8	3,5	1,8
Pressure drop cigarette in mm(H ₂ O)	112	144	114	110	107
CO/tar	1,19	1,15	0,74	0,57	0,42

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Table 3:

	SF	HF	HF	HF	HF
Pressure drop filter in mm(H ₂ O)	124	100	98	99	98
Filter ventilation	56,7	0,0	45,2	51,1	62,5
tar in mg	3,33	8,8	6,3	5,2	4,4
CO in mg	4,24	11,3	5,4	3,6	2,6
Pressure drop cigarette in mm(H ₂ O)	107	144	125	121	120
CO/tar	1,27	1,28	0,86	0,69	0,59

Figure 3 shows in cross section a filter element 14 of the invention, where like parts are labelled in accordance with Figure 1, attached to a tobacco rod 12. The plug wrap 18 used to overlie the filter plug 16 includes a portion that has particulate activated carbon adhered thereto in the region 26. Grooves 20 are formed in the plug wrap 18 after the plug wrap is wrapped around the filter plug 16. The filter element is thus an integral element.

An alternative embodiment along the same theme is shown in Figure 4. However, in this embodiment the filter element comprises three sections: a grooved section in which grooves 20 are formed in the surface thereof, a Dalmatian carbon section 28 comprising particles of activated carbon dispersed in cellulose acetate tow, and a conventional cellulose acetate tow section 30. The three sections may be joined together by one plug wrap which is mouldable to produce the grooves of the grooved section. Alternatively, the grooves are formed in the surface of either a self-sustaining non-wrapped acetate (NWA) section or a plug wrap enwrapping a cellulose acetate section. The three sections are then aligned together and then overwrapped with a further plug wrap (not shown).

The embodiments of Figure 3 and 4 avoid the problem of having to mould grooves into a filter section containing particulate matter, during which moulding there may be adverse effects on the particulate matter if contacted with heating elements. However, it is possible to thermally form grooves in a carbon-containing section, particularly if use is made of a thermoformable plugwrap, and such is an option open to the cigarette designer.

In addition, the presence of additive material affects other vapour phase constituents and can be particularly advantageous for the selective removal of some of those compounds on

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the Hoffmann analyte list (see Hoffmann, D., Hoffmann, I, "Tobacco Smoke Components",
Beitrage zur Tabakforschung International 18 (1998) 49).

CLAIMS

1. A smoking article incorporating a filter element (14) comprising a filter plug (16) of homogeneous filtration material, a plug wrap (18) overwrapping the filter plug (16), circumferentially spaced grooves extending longitudinally of the filter plug (16), and a ventilating tipping paper interconnecting the filter element (14) to a tobacco rod (12), a number of grooves (20) being open on the side of the tobacco rod (12) and extending continuously only over a part of the length of the filter element (14), and hence not up to the mouth end of the filter element (14), which grooves (20) are axially aligned with respect to the filter axis, in to which axially extending grooves (20) ventilating air enters via overlying ventilating tipping paper, and any mouth end extending groove not being ventilated.
2. A smoking article in accordance with Claim 1, characterised in that the filtration material of filter plug (16) is homogeneous over the full length of the filter plug (16).
3. A smoking article in accordance with Claim 1 or 2, characterised in that the grooves (20) extend over a maximum of 80% of the length of the filter plug (16).
4. A smoking article in accordance with any one of the Claims 1 to 3, characterised in that the length of the grooves (20) amounts to about 40 to 70%, in particular about 55 to 65% of the length of the filter plug (16).
5. A smoking article in accordance with any one of the Claims 4, characterised in that the length of the grooves (20) amounts to 55 to 65% of the length of the filter plug (16).
6. A smoking article in accordance with one of the Claims 1 to 5, characterised in that two to ten grooves (20) are provided.
7. A smoking article in accordance with Claim 6, characterised in that three to five grooves are provided.
8. A smoking article in accordance with Claim 7, characterised in that four grooves are provided.
9. A smoking article in accordance with one of the Claims 1 to 8, characterised in that the grooves (20) are distributed symmetrically over the circumference of the filter plug (16).
10. A smoking article in accordance with one of the Claims 1 to 9, characterised in that the grooves (20) are V-shaped or U-shaped.
11. A smoking article in accordance with one of the Claims 1 to 10, characterised in that the grooves have a depth from 0.5 to 2 mm.

12. A smoking article in accordance with one of the Claims 1 to 11, characterised in that the grooves (20) at the circumference have a width of 1 to 3 mm.
13. A smoking article in accordance with one of the Claims 12, characterised in that the grooves (20) at the circumference have a width of from 1.5 to 2.5 mm.
14. A smoking article in accordance with one of the Claims 1 to 13, characterised in that the filter plug (16) consists of filter tow made of cellulose acetate.
15. A smoking article in accordance with Claim 14, characterised in that the filter plug (16) contains additives such as activated charcoal, zeolites, Duolite or flavour-altering additives.
16. A smoking article in accordance with one of the Claims 1 to 15, characterised in that the plug wrap (18) is air impermeable.
17. A smoking article in accordance with one of the Claims 1 to 16, characterised in that the plug wrap is porous and/or provided with ventilation holes.
18. A smoking article in accordance with one of the Claims 1 to 17, characterised in that the tipping paper (22) is porous.
19. A smoking article in accordance with one of the Claims 1 to 17, characterised in that the tipping paper (22) is provided with ventilation openings (24) by mechanical or electrostatic means or by laser beams.
20. A smoking article in accordance with one of the Claims 1 to 19, characterised in that the degree of ventilation of the tipping paper (22) lies between 30 and 80%, more particularly between 40 and 70%.
21. A smoking article in accordance with one of the Claims 20, characterised in that the degree of ventilation of the tipping paper (22) lies between 40 and 70%.
22. A smoking article in accordance with one of the Claims 1 to 21, characterised in that additional, short grooves intended as indication for the existence of the grooves (20) are provided on the mouth side of the filter plug (16).
23. A smoking article comprising a cylindrical filter plug (16) of filtration material, a plug wrap (18) for the filter plug (16), grooves (20) extending longitudinally along the filter plug (16) also impressed into the plug wrap (18), and a tipping paper for connecting the filter plug (16) to a tobacco rod (12), characterised in that all grooves (20) are open on the side of the tobacco rod (12) and extend continuously only over a part of the length of the filter plug (16), and hence not up to the mouth end of the filter plug (16) and that all grooves (20) are covered with the ventilated tipping paper (22).
24. Use of a smoking article in accordance with one of the Claims 1 to 23 for the reduction of the CO/tar ratio as a function of the filter ventilation.

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Fig.1.

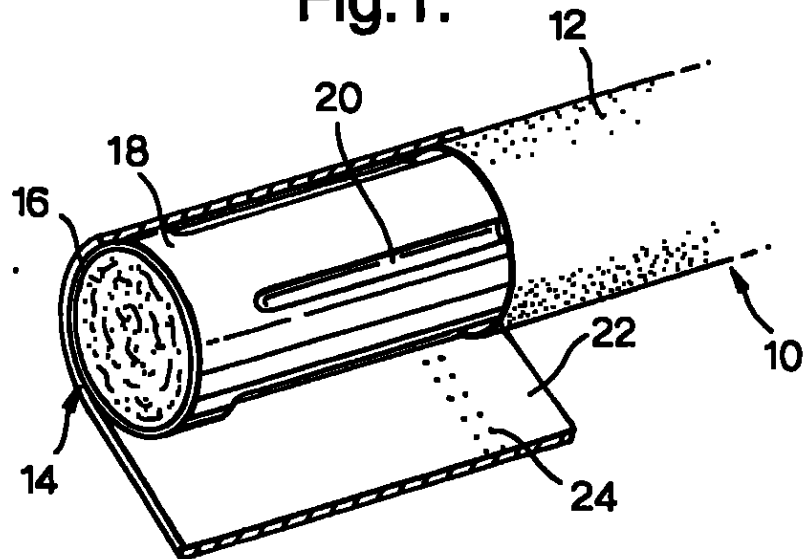


Fig.2.

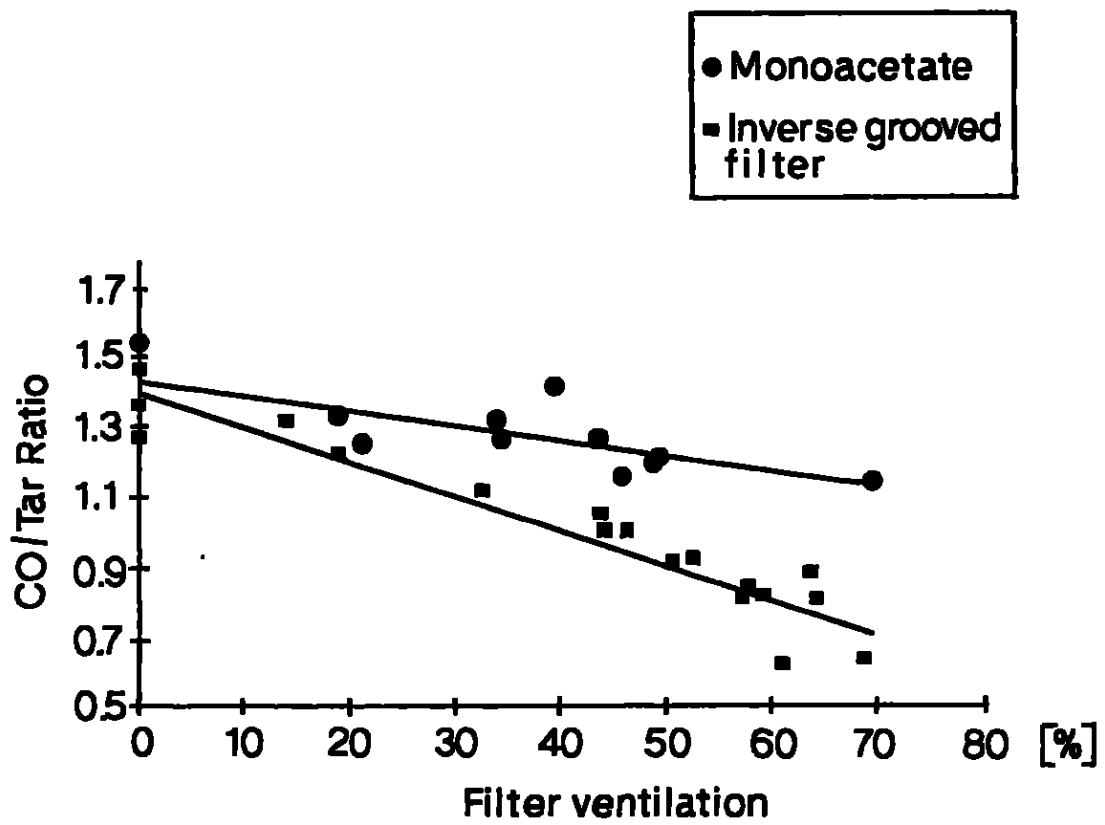


Fig.3.

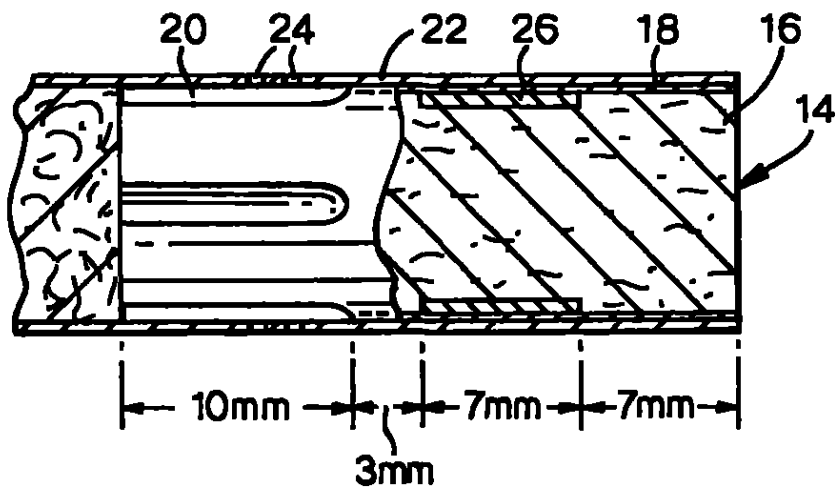
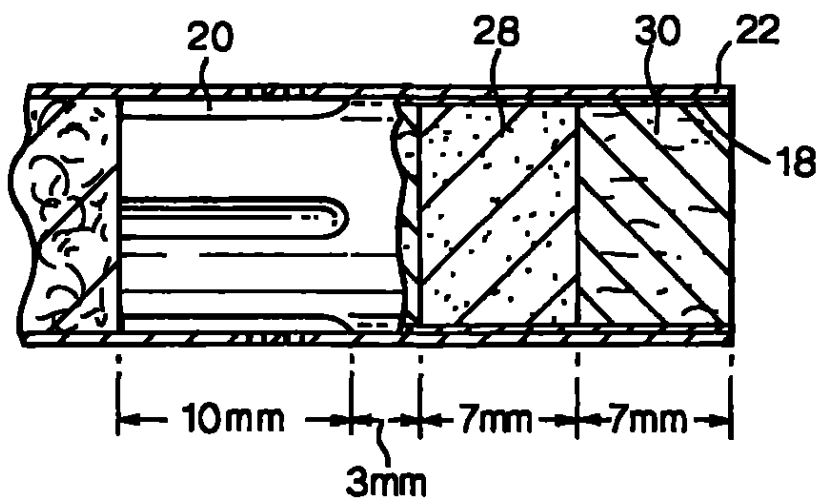


Fig.4.



INTERNATIONAL SEARCH REPORT

International Application No
PC1/GB 02/05603

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 A24D3/04		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) IPC 7 A24D		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the International search (name of data base and, where practical, search terms used) WPI Data, PAJ, EPO-Internal		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
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☒ Further documents are listed in the continuation of box C. ☒ Patent family members are listed in annex.		
* Special categories of cited documents : "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (see specification) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "A" document member of the same patent family		
Date of the actual completion of the international search 16 April 2003		Date of mailing of the international search report 25/04/2003
Name and mailing address of the ISA European Patent Office, P.O. Box 5816 Patenkamp 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 851 epo nl, Fax (+31-70) 340-2016		Authorized officer Riegel, R

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Artículo para fumar ventilado

La invención se relaciona con un artículo para fumar, en particular aunque no exclusivamente un cigarrillo que tiene un filtro, en cuyo contorno se estampan acanaladuras.

Se conocen varias formas de realización de tales filtros. La patente US 4.406.294 revela un filtro para cigarrillo con un cuerpo de filtro cilíndrico, con una envoltura del cuerpo del filtro permeable al aire y que presenta acanaladuras practicadas en el contorno del cuerpo del filtro, las que se extienden en una parte del largo del filtro, a partir del extremo del filtro que se introduce en la boca. Sin embargo, las acanaladuras son impermeables. El cuerpo cilíndrico del filtro y con ello también las acanaladuras están unidas por medio de un papel de cobertura permeable al aire, provisto de aberturas de ventilación. El filtro tiene una estructura poco complicada y logra, en general, un descenso normal de la presión en todo el cigarrillo.

La US 4.256.122 revela un filtro para cigarrillo con una estructura similar, donde sin embargo, la superficie del contorno del cuerpo del filtro, incluyendo las paredes de las acanaladuras, es impermeable debido a una envoltura impermeable del cuerpo del filtro. En este caso, algunas acanaladuras son abiertas en el extremo del filtro que se introduce en la boca. En las figuras 2, 3 y 5 se ilustran las formas de realización, en las cuales también se han previsto acanaladuras abiertas en el extremo que se une con el tabaco. Con este filtro se obtiene un cigarrillo de intenso sabor a tabaco, conservando la elevada reducción de sustancias indeseables contenidas en el humo y la posibilidad de su elaboración en máquinas convencionales de fabricación de cigarrillos. Sin

embargo, algunas de estas formas de realización requieren un registro preciso de la cobertura perforada del filtro con acanaladuras en el contorno de la boquilla, lo que acarrea inconvenientes de fabricación y de calidad.

La US 4.649.943 describe otra modificación de un filtro de este tipo, en el cual las acanaladuras están abiertas en el extremo que se introduce en la boca. Además, se prevé por lo menos una perforación en la zona de las acanaladuras destinada a admitir aire en el cuerpo del filtro a través de la envoltura del filtro, con lo cual se obtiene una mejor distribución del aire en la barra del filtro. A esto contribuye una envoltura de la boquilla de material impermeable que presenta una zona permeable al aire. El papel de envoltura (envoltura del filtro) es impermeable, pero presenta aberturas de ventilación.

También en la DE-PS 21 07 850 se revela una boquilla de filtro, cuyo contorno es mejorado con acanaladuras longitudinales. No se menciona una envoltura del filtro y las acanaladuras son abiertas, preferentemente en el extremo que se introduce en la boca.

La US 4.362.171 revela un filtro para cigarrillo con acanaladuras que no están abiertas ni en el extremo del tabaco ni en el extremo que se introduce en la boca, es decir que solamente se extienden en el centro del cuerpo del filtro. Cada acanaladura está provista de una abertura, de manera que el aire de ventilación es dirigido en dirección longitudinal de la barra de filtro, hacia el extremo que se introduce en la boca. Es decir que se introduce aire a alta velocidad de manera sencilla en el filtro del cigarrillo sin que exista el peligro de cortar su circulación al apretar los labios y/o de una pérdida de presión.

La US 4.343.319 revela un filtro para cigarrillo similar, con una envoltura

del filtro impermeable al humo y con un tubo central que se extiende axialmente a través del cuerpo del filtro y que está en comunicación de circulación con las aberturas de las acanaladuras. De esta manera, el humo que sale de la barra de tabaco se divide en dos partes. Una parte pasa por el tubo central y la otra, a través del material del filtro. La presencia de tubos y pasajes de interconexión aumenta la complejidad de la fabricación del filtro.

También se conoce de la DE 30 48 905 A1 un filtro para cigarrillo con una envoltura del núcleo del filtro impermeable al aire y con acanaladuras en el contorno del núcleo del filtro que se extienden a todo lo largo del núcleo del filtro. Este filtro es más fácil de fabricar, ya que no es necesario cambiar la dirección de la producción.

La GB 2102271 describe un filtro para humo de tabaco provisto de acanaladuras en su contorno, formadas con un material corrugado colocado alrededor del filtro propiamente dicho. La envoltura del filtro que rodea el material de filtro es impermeable al humo. Se prevén acanaladuras entre la envoltura del filtro y el material corrugado y también entre la cubierta del filtro y el material corrugado. La cobertura del filtro está provista de aberturas de ventilación. Este elemento de filtro es de uso muy versátil y flexible.

La GB 2 089 641 A revela un filtro para cigarrillo con un tubo central hueco que se extiende desde un extremo del filtro al interior del material de filtro. El núcleo del filtro está rodeado de una envoltura no porosa y el cuerpo del filtro y la envoltura tienen por lo menos una acanaladura que se extiende en sentido longitudinal, desde uno de los extremos del cuerpo del filtro. De esta manera se logra una reducción normal de la presión en el cigarrillo para un filtro

de escaso a moderado eficiencia. La formación de un tubo hueco complica la fabricación.

También la GB 2 136 669 A presenta un filtro de cigarrillo cuyo cuerpo está rodeado de un material permeable al humo. El filtro tiene ondulaciones longitudinales que forman acanaladuras fuera de la envoltura permeable al humo, las que están abiertas en uno de los extremos del filtro y se extienden en dirección longitudinal, desde uno al otro extremo, aunque no en toda la extensión del cuerpo del filtro. La envoltura permeable al humo presenta medios, es decir, un recubrimiento que la hace impermeables al humo en una zona que se extiende en sólo una parte de la longitud de las acanaladuras y separa una zona acanalada de la envoltura que es permeable al humo, del respectivo extremo.

La GB 2 095 093 A revela un filtro que tiene un cuerpo que presenta una envoltura no-porosa y acanaladuras que se extienden un trecho determinado a partir de uno de los extremos del filtro en dirección al otro . Las acanaladuras pueden estar abiertas a la atmósfera y estar orientadas de manera que se extiendan hasta el extremo que se introduce en la boca o hasta el extremo que se conecta con el tabaco. También es posible disponer alternadamente las acanaladuras que empiezan en el extremo que se introduce en la boca y las que empiezan en el extremo que se conecta con el tabaco. El filtro se sujeta a la barra de tabaco por medio de una angosta franja de material, a fin de excluir interrupciones del acceso de las aberturas de ventilación a las acanaladuras.

La US-A-3,752,165 describe un artículo para fumar con un cuerpo de filtro envuelto en un delgado papel de envoltura poroso. En un extremo del filtro

se forma una pluralidad de acanaladuras en el papel de envoltura y en el material del filtro. Las acanaladuras se extienden desde un extremo del filtro hasta un lugar situado poco antes del extremo opuesto y están rodeadas por un papel de envoltura impermeable al humo. Las acanaladuras se extienden desde uno de los extremos del filtro hasta un lugar que está a cierta distancia del otro extremo. Con este filtro se logra un alto grado de efectividad en la eliminación de sustancias de condensación del humo de tabaco, con una disminución de presión aceptable.

Asimismo, en la US-A-3.910.288 se describe un cuerpo de filtro, en cuyo contorno se encuentran dispuestas acanaladuras que se extienden desde el extremo que está en contacto con el tabaco hasta un lugar del filtro situado delante del extremo que se introduce en la boca. Las acanaladuras están conformadas en una envoltura plástica rígida que rodea el material del filtro. En uno de los extremos de cada acanaladura se ha previsto una abertura que posibilita una comunicación con el material del filtro. No se ha previsto una ventilación del filtro.

Este filtro es muy resistente al aplastamiento, de manera que las acanaladuras o cada una de ellas puede permanecer abierta hasta que se termina de fumar todo el artículo para fumar. Debido a la modificación gradual de la proporción de humo que pasa por las acanaladuras, desde un valor definido previamente hasta un valor 0, el filtro permite una entrega casi uniforme de material particulado por pitada gracias a un aumento relativamente constante del grado de efectividad del filtro.

Finalmente, la USA 3,596,663 presenta un filtro para un artículo para

fumar que tiene un filtro cuyo cuerpo presenta acanaladuras de longitud indefinida. Tanto la envoltura del filtro como el papel de cobertura son porosos o están provistos de perforaciones. La envoltura permeable al aire es corrugada para aumentar el área permeable al aire y simplificar así la trayectoria del aire que es admitido a través del papel de cobertura ventilado al material del cuerpo del filtro. De esta manera se crea un filtro ventilado que reduce significativamente la limitación del paso de aire hacia el medio de filtro.

Resumiendo, se comprueba que desde hace muchos años se ofrecen filtros para cigarrillos provistos de acanaladuras, que permiten diferentes direccionamientos del humo y/o del aire, en función de la posición y la longitud de las acanaladuras, así como de la porosidad y/o ventilación de la boquilla / papel de envoltura del filtro. Con ello es posible lograr la dilución del humo, un arremolinamiento del humo en el espacio bucal, el direccionamiento separado de aire de ventilación y humo y otros efectos.

En los últimos años, uno de los componentes del humo ha atraído la atención: se trata del monóxido de carbono (CO), para el cual aún no se conoce ningún filtro efectivo económicamente conveniente. Especialmente en vista de las nuevas disposiciones legales que prescribe una cantidad máxima de CO en el humo del tabaco de un cigarrillo, se buscan medios para reducir el contenido de CO del humo por debajo de un valor máximo dado.

El objeto de la invención es crear un filtro para un artículo para fumar, particularmente un cigarrillo, que permita una reducción efectiva, especialmente ajustable, del CO contenido en el humo, en comparación con otras sustancias presentes, tales como sustancias de condensación y nicotina.

Este objetivo se alcanza con las características de la reivindicación 1 de esta invención.

Las características que se describen en las reivindicaciones secundarias definen formas de realización apropiadas.

Debido al mecanismo de flujo del filtro de la presente invención, la retención del material de filtro se reduce debido a su dependencia conocida de la velocidad de flujo lineal / reducción de la retención, al aumentar la velocidad de flujo. Dado que el nivel de CO no es afectado por el material de filtro, la relación CO/sustancias de condensación decrece.

Si en el filtro de la invención se usa una envoltura del filtro impermeable al aire, el aire de ventilación fluye por las acanaladuras en dirección a la barra de tabaco y desde allí, de vuelta, a través del filtro, a la boca del fumador.

Como alternativa también se puede usar una envoltura del filtro que sea de naturaleza porosa o ventilada, es decir, provisto de aberturas de ventilación. En ese caso, una parte del aire de ventilación fluye a través de esta trayectoria de flujo, es decir, a través de la envoltura permeable hacia el filtro y a la boca del fumador. Esta parte del humo puede ser regulada por correspondiente ajuste de la porosidad propia o artificial de la envoltura del filtro, con lo cual es posible influir la relación caída de presión/mecánica del fumar, así como la relación CO/sustancias de condensación

Otra alternativa es usar hojas o películas plásticas porosas o ventiladas como material de envoltura del filtro.

El uso de perforación láser en máquina del papel de cobertura de la boquilla y una envoltura impermeable del cuerpo del filtro es particularmente útil

para un escaso desprendimiento de productos, con un desprendimiento de sustancias de condensación de menos de 3 mg, preferentemente menos de 1 mg. Para dicho escaso desprendimiento de productos puede ser ventajoso prever dos hileras de aberturas de ventilación, una hilera ubicada encima de las acanaladuras que se extienden axialmente y otra hilera ubicada corriente abajo de aquellas aberturas. La perforación mecánica on-line perfora tanto la envoltura del filtro como el material del filtro que se encuentra debajo, permitiendo el ingreso de aire de ventilación. Por lo tanto, se obtiene una ventilación mixta, es decir, a través de acanaladuras y del material del filtro.

Las envolturas del cuerpo del filtro de material sintético o termoformable, como las que se describen en las patentes británicas Nrs. 2058543, 2056841 o 2134365 también pueden ser especialmente apropiadas como envoltura moldeable en caliente en la presente invención.

Los ensayos realizados han demostrado que la relación CO/sustancias de condensación que se puede obtener cambia en función de la ventilación del filtro, es decir que, aumentando la ventilación del filtro se puede reducir la relación CO/sustancias de condensación, con lo cual resulta otra variable de corrección para la relación CO/sustancias de condensación.

En una forma de realización preferida se prevén dos a diez acanaladuras, ya que el uso de una sola acanaladura produce una distribución muy asimétrica del aire de ventilación en el humo, lo cual podría menoscabar el placer de fumar.. Más de diez acanaladuras complica excesivamente la fabricación y apenas deja lugar para un diámetro de flujo suficiente de las diferentes acanaladuras. Se lograron buenos resultados con cuatro

acanaladuras.

La sección de las acanaladuras tiene forma de V, aunque muy preferentemente de U, dado que esta forma ofrece ventajas de fabricación y de flujo.

Eligiendo la cantidad apropiada de acanaladuras, su profundidad, su ancho y su longitud apropiada es posible ajustar las propiedades del filtro a las propiedades deseadas del cigarrillo a producir.

Puede usarse cualquier material de filtro convencional, pudiendo emplearse uno o varios de estos materiales. Se prefiere usar una estopa de filtro (tow) convencional de acetato de celulosa. Para endurecer el filtro se usan técnicas convencionales, p. ej. agregando triacetina o Tegda a la estopa de filtro.

También es posible agregar a los filtros aditivos tales como carbón activado, zeolitas, modificadores del sabor o una resina de intercambio iónico tal como la conocida bajo la denominación de Duolite (véase patentes USA Nrs. 3.716.500 o 3.943.832) que es una sal porosa en partículas de una resina de intercambio aniónico débilmente básica, para reducir otros componentes en la fase de vapor.

Es preferible que el material del filtro sea homogéneo. Tal como se usa en la presente, "homogéneo" se aplica a los materiales de filtro que no presentan aberturas de flujo, tubos u otros elementos en el material de filtro. Por lo tanto, una estopa de filtro homogéneo puede estar formado por materiales de filtro diferentes, tales como diferentes secciones de filtrado si el filtro fuera un filtro múltiple. Un material de filtro homogéneo tiene la ventaja de

ser de fabricación simple.

Preferentemente, el aditivo se ubica en una zona del filtro que no tiene acanaladuras. Esto impide la descomposición térmica del aditivo al realizar el moldeado de las acanaladuras.

En una forma de realización preferida, las acanaladuras se extienden en menos del 80 % del largo del filtro, obteniéndose buenos resultados con aproximadamente 60 %.

La profundidad de las acanaladuras deberá ser del orden de 0,5 a 2 mm, preferentemente de aproximadamente 1 mm, con lo cual resultan volúmenes de flujo apropiados.

Teniendo en cuenta esto, el ancho de las acanaladuras, medido en el contorno del filtro, deberá ser de entre 1 y 3 mm, preferentemente de entre 1,5 y 2,5 mm.

La profundidad de las acanaladuras a lo largo del eje de la barra no necesariamente debe ser constante. Por ejemplo, puede aumentar hacia el extremo abierto, el lado del filtro que se une con el tabaco. Las acanaladuras tampoco necesitan ser lineales, pueden ser p. ej. en forma de espiral o helicoidales alrededor del filtro.

En algunos casos puede ser necesario agregar otra acanaladura al filtro que corra radialmente alrededor del contorno del filtro. Esta acanaladura puede conectarse con las acanaladuras axiales. Es útil que esta acanaladura radial esté ubicada directamente debajo de la zona de ventilación del papel de cobertura, lo cual aumenta el efecto de ventilación. En casos de zonas de ventilación más grandes, también puede ser necesario usar dos o más

acanaladuras radiales.

El filtro de esta invención obviamente puede ser incluido como parte de un dispositivo de filtrado doble o triple.

El papel de cobertura que sirve para sujetar el filtro a la barra de tabaco puede tener una estructura convencional, con la condición de que permita la ventilación. Esto se logra, ya sea usando un papel de cobertura poroso, es decir, de naturaleza permeable al aire o practicando aberturas de ventilación por medios mecánicos, electroestáticos o por rayos láser.

Para que la invención sea comprendida con claridad y llevada a la práctica con facilidad, a continuación se la describirá más detalladamente por medio de ejemplos de realización y con referencia a los dibujos esquemáticos que se acompañan, en los cuales:

la Figura 1 es una vista en perspectiva de un filtro colocado en una barra de tabaco con el papel de cobertura parcialmente enrollado,

la Figura 2 muestra una curva de la relación CO/sustancias de condensación, en función de la ventilación del filtro, para un filtro de la invención y un filtro comparativo,

la Figura 3 ilustra una realización de un filtro que contiene un aditivo en partículas y

la Figura 4 presenta otra forma de realización de un filtro que contiene un aditivo en partículas.

La Figura 1 muestra una vista en perspectiva de una parte de un cigarrillo propuesto, designada en general 10, con una barra de tabaco convencional 12 y un elemento de filtro 14 unido en un extremo de la barra de

tabaco 12. El elemento de filtro 14 consiste en un filtro de cuerpo cilíndrico 16 de estopa de filtro (tow) de acetato de celulosa, que está distribuida de manera homogénea en todo el volumen del cuerpo del filtro 14. Por lo tanto, no se han previsto aberturas de flujo, tubos, etc. en el cuerpo del filtro 14. Tal como se usa aquí, "homogéneo" significa, aplicado al material de filtro, que el material de filtro no tiene aberturas de flujo, tubos u otros elementos. Un material de filtro homogéneo puede comprender por lo tanto, diferentes materiales de filtro, tales como diferentes zonas de filtrado que se describen más abajo con referencia a la Fig. 4, ninguna de las cuales contiene aberturas de flujo, tubos, etc.

El cuerpo del filtro 16 está rodeado con una envoltura del filtro 18, que es impermeable al aire, si bien en otras formas de realización (que no se muestran) puede ser de naturaleza porosa y/o estar provista de aberturas de ventilación, según los requerimientos, es decir, especialmente teniendo en cuenta el sabor de tabaco deseado.

Las acanaladuras 20 están estampadas en el contorno del cuerpo del elemento de filtro 14, que en la forma de realización representada son cuatro acanaladuras 20 distribuidas simétricamente en el contorno del elemento de filtro 14. Las acanaladuras 20 se extienden hasta el extremo del elemento de filtro 14 que está en contacto con el tabaco y son abiertas en dicho extremo, de modo que existe una comunicación de flujo entre las acanaladuras 20 y la barra de tabaco 12.

Las acanaladuras 20 están dispuestas en el contorno del cuerpo del filtro 16 en dirección axial y terminan a una distancia reológicamente adecuada del extremo del filtro 14 que se introduce en la boca, es decir, a una distancia en

que no puede llegar ni aire ni humo por las acanaladuras 20 directamente al extremo del filtro 14 que se introduce en la boca.

Los ensayos realizados han demostrado que la longitud axial de las acanaladuras 20 debe ser de menos del 80 % de la longitud del cuerpo del filtro 14. Se prefiere una longitud de aproximadamente 60%.

Las acanaladuras 20 tienen una profundidad de aprox. 1,5 mm y una sección de forma de U y un ancho de aproximadamente 2 mm en el contorno.

El cuerpo del filtro 14 se rodea de manera habitual con el papel de cobertura 22, el que, en la forma de realización representada, está provisto de dos hileras perimetrales paralelas de aberturas de ventilación 24. También se pueden prever más o menos hileras de aberturas de ventilación 24 o el papel de cobertura 22 puede ser de naturaleza porosa. Solo se debe asegurar que la porosidad o la cantidad y el tamaño de las aberturas de ventilación 24 garantice el grado de ventilación deseado.

Para la elección del papel de envoltura del filtro 18 existen, en principio, dos posibilidades: el uso de un papel impermeable al aire o de un papel permeable al aire. Si se utiliza un papel impermeable al aire como envoltura del filtro 18, al fumar el cigarrillo, el aire de ventilación fluye a través de las aberturas de ventilación 24 hacia las acanaladuras 20 y luego por las acanaladuras 20 en dirección a la barra de tabaco, donde la dirección se invierte y el aire de ventilación fluye entonces, junto con el humo, desde la barra de tabaco 12, a través del cuerpo del filtro 16, a la boca del fumador.

Si el papel de envoltura del filtro es permeable al aire, o sea de naturaleza porosa o provisto de aberturas de ventilación, una parte ajustable

del aire de ventilación fluye a través de esta trayectoria de flujo a través de la envoltura permeable al aire de la envoltura del filtro, hacia el interior del filtro y a la boca del fumador. La otra parte del aire fluye a través de las acanaladuras 20 . De esta manera, es posible ajustar la dilución del humo con aire de ventilación en dos lugares: primero, en la ventilación a través del papel de cobertura 22 y a lo largo de las acanaladuras 20 y segundo por medio del aire de ventilación que entra directamente a través de la envoltura del filtro 18 al material del filtro 16.

Si fuera necesario, pueden estamparse otras acanaladuras cortas, abiertas solamente hacia el extremo del filtro 14 que se introduce en la boca, en el lado externo del papel de cobertura 22, las que no cumplen ninguna función reológica, dado que no están comunicadas con la zona de ventilación 24, sino que sólo indican al fumador la presencia de acanaladuras en el filtro 14.

La Figura 2 muestra una curva del efecto de la ventilación del filtro sobre la relación CO/sustancias de condensación en un filtro de estopa de filtro convencional (tow) de acetato de celulosa de acuerdo con la invención, una envoltura del filtro impermeable al aire y cuatro acanaladuras 20 de las medidas indicadas más arriba, distribuidas simétricamente en el contorno del cuerpo del filtro 16 que se extienden a lo largo de 60% de la longitud del elemento de filtro 14, a partir del extremo en contacto con el tabaco

En los ensayos realizados se varió la ventilación del filtro 14, específicamente, desde una ventilación 0 hasta un grado de ventilación máximo de 70 %. A fin de obtener el grado de ventilación requerido para

productos de 3 mg o menos es necesario usar adicionalmente perforación láser en máquina, así como boquillas preperforadas. Este mayor grado de ventilación también ayuda a reducir la caída de presión del cigarrillo. La reducción de la relación CO/sustancias de condensación obtenida se equilibra con el grado de ventilación.

En la figura, los círculos negros indican los valores medidos en un filtro convencional de estopa de monoacetato sin acanaladuras, mientras que los cuadrados indican los valores medidos en un filtro 14 de acuerdo con la invención, con la estructura descrita más arriba y las mismas medidas que el filtro comparativo.

Se aprecia perfectamente que el elemento de filtro de acuerdo con la invención 14 reduce el contenido de CO del humo con respecto a las sustancias de condensación emitidas y por lo tanto, la relación CO/sustancias de condensación de aproximadamente 1,4 a aproximadamente 0,7, mientras que en un filtro que solo tiene ventilación y no tiene acanaladuras, la relación CO/sustancias de condensación solamente puede ser reducida a aproximadamente 1,12.

Por lo tanto, con el elemento de filtro 14 de esta invención es posible reducir la relación CO/sustancias de condensación por debajo de los valores límite previstos por las nuevas disposiciones gracias a la elección apropiado del grado de ventilación del papel de cobertura 22.

Otros estudios de cigarrillos con filtros de acuerdo con esta invención demostraron que estos resultados también fueron confirmados para diferentes tipos de tabaco en la parte del cigarrillo destinada al tabaco. En las Tablas 1 a 3

se muestran los resultados para barras de tabaco de tres marcas de cigarrillos a las que se agregó el filtro de la presente invención. Los respectivos cigarrillos con filtros convencionales dieron niveles de sustancias de condensación de aprox. 10 mg, 6 mg y 3 mg, respectivamente. Las mediciones se llevaron a cabo según normas DIN e ISO.

Los filtros usados para estas mediciones tenían los siguientes parámetros para las acanaladuras: 4 acanaladuras de 17 mm de largo, aprox. 1,5 mm de ancho y 0,5-1 mm de profundidad. La envoltura del filtro era impermeable al aire y no tenía otras ventilaciones.

Los resultados demuestran claramente que los filtros de la invención (designados EF) permiten producir cigarrillos con caídas de presión comparables a las de cigarrillos con filtros convencionales (designados SE) ajustando el grado de ventilación, pero con relaciones CO/sustancias de condensación claramente reducidas.

TABLA 1

	SF	EF	EF	EF	EF	EF
Caída de presión filtro en mm(H ₂ O)	72	76	76	74	73	72
Ventilación filtro	22,6	0,0	12,0	51,8	57,2	62,1
Sust.condensación en mg	10,25	12,4	11,7		7,2	
CO en mg	11,21	13,3	12,1	6,7	4,5	
Caída de presión en el cigarrillo en mm(H ₂ O)	117	137	121	104	93	93
CO/ Sust.condensación	1,09	1,07	1,03	0,76	0,63	0,51

Tabla 2:

	SF	EF	EF	EF	EF
Caída de presión filtro en mm(H ₂ O)	108	90	89	91	89
Ventilación filtro	43,0	0,0	50,6	58,3	69,1
Sust.condensación en mg	5,6	11,4		8,1	4,3
CO en mg	6,7	13,1	5,8	3,5	1,8
Caída de presión en el cigarrillo en mm(H ₂ O)	112	144	114	110	107
CO/ Sust.condensación	1,19	1,15	0,74	0,57	0,42

Tabla 3:

	SF	EF	EF	EF	EF
Caída de presión filtro en mm(H ₂ O)	124	100	98	99	98
Ventilación filtro	56,7		45,2	1	62,5
Sust.condensación en mg	3,33	8,8	8,3	5,2	4,4
CO en mg	4,24	11,3		3,6	2,6
Caída de presión en el cigarrillo en mm(H ₂ O)	107	144	125	121	120
CO/ Sust.condensación	1,27	1,28	0,86	0,69	0,59

La Fig. 3 muestra una sección transversal de un elemento de filtro 14 de la invención, donde las partes similares se designan de acuerdo con la Fig. 1, unido a una barra de tabaco 12. La envoltura del filtro 18 usada para cubrir el filtro 16, incluye una porción que tiene carbón activado en partículas adheridas a la misma en la zona 26. Las acanaladuras 20 se forman en la envoltura del filtro 18 después que la envoltura del filtro ha sido colocada alrededor del cuerpo del filtro 16. El elemento de filtro es, por lo tanto, un elemento integral.

En la Fig. 4 se ilustra una forma de realización alternativa de la misma

zona. Sin embargo, en esta realización el elemento de filtro comprende tres secciones: una sección acanalada, en cuya superficie están formadas las acanaladuras 20, una sección de carbón dalmata 28 que comprende partículas de carbón activado dispersas en estopa de acetato de celulosa y una sección de estopa de filtro de acetato de celulosa convencional 30. Estas tres secciones pueden ser unidas entre sí por medio de una envoltura que se moldea para formar las acanaladuras de la sección acanalada. Como alternativa, las acanaladuras se forman en la superficie de una sección de acetato auto-sustentable, no envuelta (NWA) o de una envoltura de filtro que rodea una sección de acetato de celulosa. Luego, las tres secciones se alinean y se cubren con otra envoltura de filtro.

La forma de realización de las Figs. 3 y 4 evitan el inconveniente de tener que moldear acanaladuras en la sección de filtro que contiene material en partículas que puede provocar efectos adversos en el material en partículas si se ponen en contacto con elementos de calentamiento. Sin embargo, es posible conformar acanaladuras con calor en la sección que contiene carbón, particularmente si se usa una envoltura de filtro termoconformable, lo cual constituye una opción que tiene a su disposición el diseñador del cigarrillo.

Además, la presencia de material aditivo afecta otros componentes en fase de vapor y puede ser muy provechoso para la eliminación selectiva de algunos de dichos componentes mencionados en la lista analítica de Hoffmann (véase D. Hoffmann, I. Hoffmann, "Tobacco Smoke Components", Beitrag zur Tabakforschung International 18 (1998) 49).

REIVINDICACIONES

1. Artículo para fumar **CARACTERIZADO PORQUE** tiene un elemento de filtro (14) que comprende un cuerpo de filtro (16) de material de filtro homogéneo, una envoltura de filtro (18) que envuelve el cuerpo del filtro (16), acanaladuras circunferencialmente separadas que se extienden a lo largo del cuerpo del filtro (16) y un papel de cobertura ventilado que interconecta el elemento de filtro (14) con una barra de tabaco (12), una cantidad de acanaladuras (20) que son abiertas en el lado que mira a la barra de tabaco (12) y que solamente se extienden en forma continua en una parte de la longitud del elemento de filtro (14), es decir, no hasta el extremo del elemento de filtro (14) que se introduce en la boca, cuyas acanaladuras (20) están alineadas axialmente con respecto al eje del filtro, en cuyas acanaladuras que se extienden axialmente (20) entra aire de ventilación por vía del papel ventilado de la cobertura del filtro superpuesto y no siendo ventilada ninguna acanaladura que se extienda al extremo que se introduce en la boca.
2. Artículo para fumar de acuerdo con la reivindicación 1, **CARACTERIZADO PORQUE** el material de filtro del cuerpo del filtro (16) es homogéneo en todo el largo del cuerpo del filtro.
3. Artículo para fumar de acuerdo con la reivindicación 1 o 2 **CARACTERIZADO PORQUE** las acanaladuras (20) se extienden en un máximo del 80 % del largo del cuerpo del filtro (16).
4. Artículo para fumar de acuerdo con cualquiera de las reivindicaciones 1 a 3, **CARACTERIZADO PORQUE** la longitud de las acanaladuras (20) es de aproximadamente 40 a 70 %, particularmente de aproximadamente 55 a 65%

de la longitud del cuerpo del filtro (16).

5. Artículo para fumar de acuerdo con la reivindicación 4, CARACTERIZADO PORQUE la longitud de las acanaladuras (20) es de aproximadamente 55 a 65 % de la longitud del cuerpo del filtro (16).

6. Artículo para fumar de acuerdo con una de las reivindicaciones 1 a 5, CARACTERIZADO PORQUE se prevén dos a diez acanaladuras (20).

7. Artículo para fumar de acuerdo con la reivindicación 6, CARACTERIZADO PORQUE se prevén de tres a cinco acanaladuras.

8. Artículo para fumar de acuerdo con la reivindicación 7, CARACTERIZADO PORQUE se prevén cuatro acanaladuras.

9. Artículo para fumar de acuerdo con una de las reivindicaciones 1 a 8, CARACTERIZADO PORQUE las acanaladuras (20) están distribuidas simétricamente en el contorno del cuerpo del filtro (16).

10. Artículo para fumar de acuerdo con una de las reivindicaciones 1 a 9, CARACTERIZADO PORQUE las acanaladuras (20) tienen forma de V o de U.

11. Artículo para fumar de acuerdo con una de las reivindicaciones 1 a 10, CARACTERIZADO PORQUE las acanaladuras tienen una profundidad de 0,5 a 2 mm..

12. Artículo para fumar de acuerdo con una de las reivindicaciones 1 a 11, CARACTERIZADO PORQUE las acanaladuras (20) tienen, en el contorno, un ancho de 1 a 3 mm.

13. Artículo para fumar de acuerdo con la reivindicación 12 CARACTERIZADO PORQUE las acanaladuras (20) tienen, en el contorno, un ancho de 1,5 a 2,5 mm.

14. Artículo para fumar de acuerdo con una de las reivindicaciones 1 a 13, **CARACTERIZADO PORQUE** el cuerpo del filtro (16) es de estopa de filtro (tow) de acetato de celulosa.
15. Artículo para fumar de acuerdo con la reivindicación 14, **CARACTERIZADO PORQUE** el cuerpo del filtro (16) contiene aditivos tales como carbón activado, zeolitas, Duolite o aditivos modificadores del sabor.
16. Artículo para fumar de acuerdo con una de las reivindicaciones 1 a 15, **CARACTERIZADO PORQUE** el papel de envoltura del filtro (18) es impermeable al aire.
17. Artículo para fumar de acuerdo con una de las reivindicaciones 1 a 16, **CARACTERIZADO PORQUE** el papel de envoltura del filtro es poroso y/o está provisto de aberturas de ventilación.
18. Artículo para fumar de acuerdo con una de las reivindicaciones 1 a 17, **CARACTERIZADO PORQUE** el papel de cobertura del filtro (22) es poroso.
19. Artículo para fumar de acuerdo con una de las reivindicaciones 1 a 17, **CARACTERIZADO PORQUE**, el papel de cobertura del filtro (22) se provee de aberturas de ventilación (24) por medios mecánicos, electroestáticos o por rayos láser.
20. Artículo para fumar de acuerdo con una de las reivindicaciones 1 a 19, **CARACTERIZADO PORQUE** el grado de ventilación del papel de cobertura del filtro (22) es de entre 30 y 80 %, más particularmente de entre 40 y 70 %.
21. Artículo para fumar de acuerdo con la reivindicación 20, **CARACTERIZADO PORQUE** el grado de ventilación del papel de cobertura del filtro (22) es de entre 40 y 70%.

22. Artículo para fumar de acuerdo con una de las reivindicaciones 1 a 21, **CARACTERIZADO PORQUE** en el lado del cuerpo del filtro (16) que se introduce en la boca se prevén acanaladuras cortas adicionales destinadas a indicar la existencia de las acanaladuras (20).

23. Artículo para fumar que comprende un cuerpo del filtro cilíndrico (16) de material de filtro, una envoltura del filtro (18) para el cuerpo del filtro (16), acanaladuras (20) que se extienden a lo largo del cuerpo del filtro (16), también estampadas en la envoltura del filtro (18) y un papel de cobertura del filtro para conectar el cuerpo del filtro (16) con una barra de tabaco (12), **CARACTERIZADO PORQUE** todas las acanaladuras (20) son abiertas en el lado que mira a la barra de tabaco (12) y solamente se extienden en forma continua a lo largo de una parte de la longitud del cuerpo del filtro (16), es decir, no hasta el extremo del cuerpo del filtro (16) que se introduce en la boca, y donde todas las acanaladuras (20) están cubiertas con el papel de cobertura ventilado (22).

24. Uso de un artículo para fumar de acuerdo con una de las reivindicaciones 1 a 23 **CARACTERIZADO PORQUE** es para reducir la relación CO/sustancias de condensación en función del grado de ventilación del filtro.

p.p. British American Tobacco (Investments) Limited
Fernando Noetinger (465)

REVINDICACION COMPLEMENTARIA

Artículo para fumar CARACTERIZADO PORQUE tiene un elemento de filtro (14) que comprende un cuerpo de filtro (16) de material de filtro homogéneo, una envoltura de filtro (18) que envuelve el cuerpo del filtro (16), acanaladuras circunferencialmente separadas que se extienden a lo largo del cuerpo del filtro (16) y un papel de cobertura ventilado que interconecta el elemento de filtro (14) con una barra de tabaco (12), una cantidad de acanaladuras (20) que son abiertas en el lado que mira a la barra de tabaco (12) y que solamente se extienden en forma continua en una parte de la longitud del elemento de filtro (14), es decir, no hasta el extremo del elemento de filtro (14) que se introduce en la boca, cuyas acanaladuras (20) están alineadas axialmente con respecto al eje del filtro, en cuyas acanaladuras que se extienden axialmente (20) entra aire de ventilación por vía del papel ventilado de la cobertura del filtro superpuesto y no siendo ventilada ninguna acanaladura que se extienda al extremo que se introduce en la boca.

Artículo para fumar ventilado**RESUMEN**

Cuerpo de filtro de un artículo para fumar para un cigarrillo, con un cuerpo del filtro cilíndrico que tiene una envoltura para el cuerpo del filtro, con acanaladuras estampadas en la envoltura del cuerpo del filtro y con un papel de cobertura para unir el cuerpo del filtro con una barra de tabaco. Algunas de las acanaladuras se extienden axialmente con respecto al eje del cuerpo del filtro y son abiertas en el lado de la barra de tabaco y se extienden en forma continua a lo largo de una parte de la longitud del cuerpo del filtro. Todas las acanaladuras están cubiertas con un papel de cobertura ventilado que permite que sólo entre aire de ventilación en las acanaladuras que se extienden axialmente.

Además, la invención se relaciona con el uso de un filtro de este tipo para reducir la relación CO/sustancias de condensación en función de la ventilación del filtro.

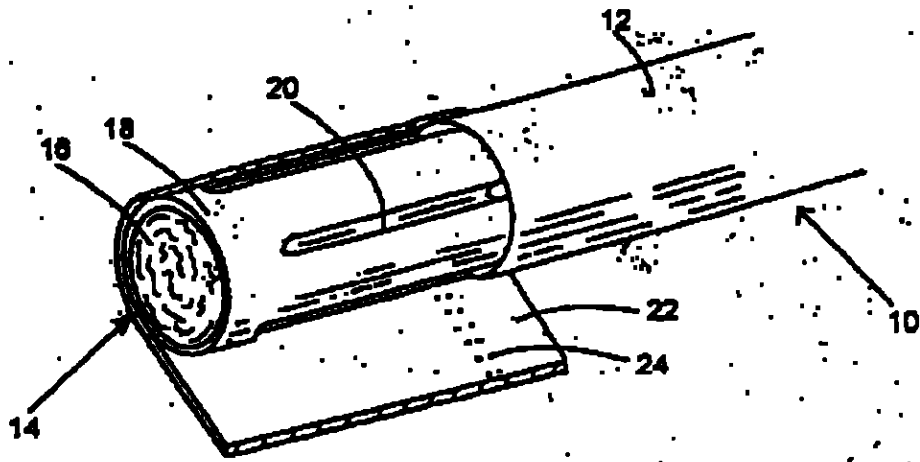


FIG. 1

**RELACIÓN CO/SUSTANCIAS DE CONDENSACIÓN COM FUNCIÓN
DE LA VENTILACIÓN DEL FILTRO**

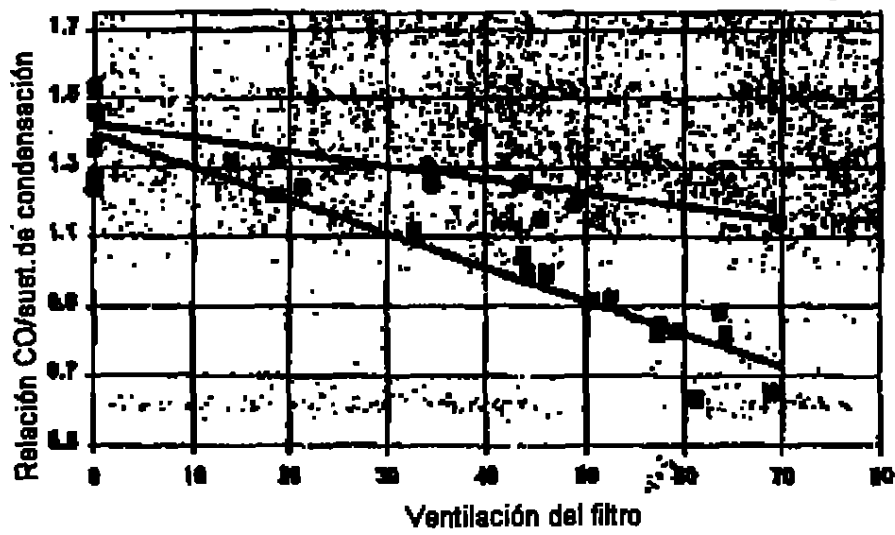


FIG. 2

- Monoacetato
- Acanaladura inversa

2/2

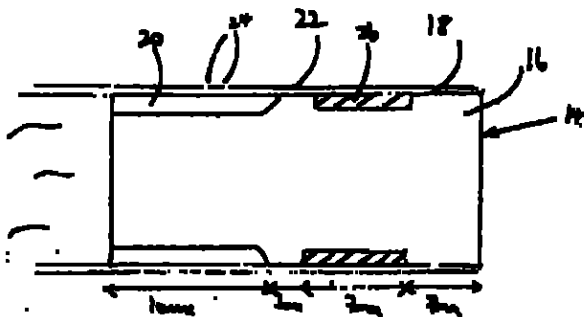


Figure 3

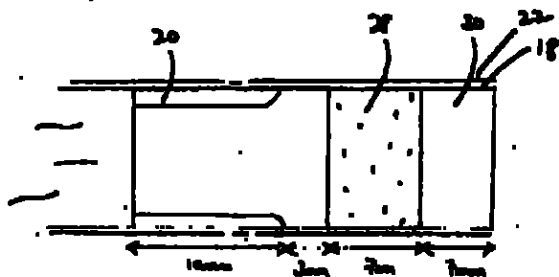


Figure 4

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference RD-BAT-10	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/16)	
International application No. PCT/GB 02/05603	International filing date (day/month/year) 11.12.2002	Priority date (day/month/year) 18.12.2001
International Patent Classification (IPC) or both national classification and IPC A24D3/04		
Applicant BRITISH AMERICAN TOBACCO (INVESTMENTS) LTD. et al.		
1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36. 2. This REPORT consists of a total of 4 sheets, including this cover sheet. ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 807 of the Administrative Instructions under the PCT). These annexes consist of a total of 3 sheets.		
3. This report contains indications relating to the following items: I ☒ Basis of the opinion II ☐ Priority III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV ☐ Lack of unity of invention V ☒ Reasoned statement under Rule 66.2(a)(II) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI ☐ Certain documents cited VII ☐ Certain defects in the international application VIII ☐ Certain observations on the international application		
Date of submission of the demand 06.07.2003	Date of completion of this report 06.02.2004	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523454 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Pille, S Telephone No. +49 89 2399-2097 	

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/GB 02/05603**

I. Basis of the report

1. With regard to the elements of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).*):

Description, Pages

1-11 as originally filed

Claims, Numbers

1-24 received on 28.01.2004 with letter of 22.01.2004

Drawings, Sheets

1/2-2/2 as originally filed

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/GB 02/05603**

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	3-8, 11-13, 15, 19-22
	No: Claims	1, 2, 9, 10, 14, 16-18, 23, 24
Inventive step (IS)	Yes: Claims	3-8, 11-13, 15, 20-22
	No: Claims	1, 2, 9, 10, 14, 16-18, 23, 24
Industrial applicability (IA)	Yes: Claims	1-24
	No: Claims	

2. Citations and explanations

see separate sheet

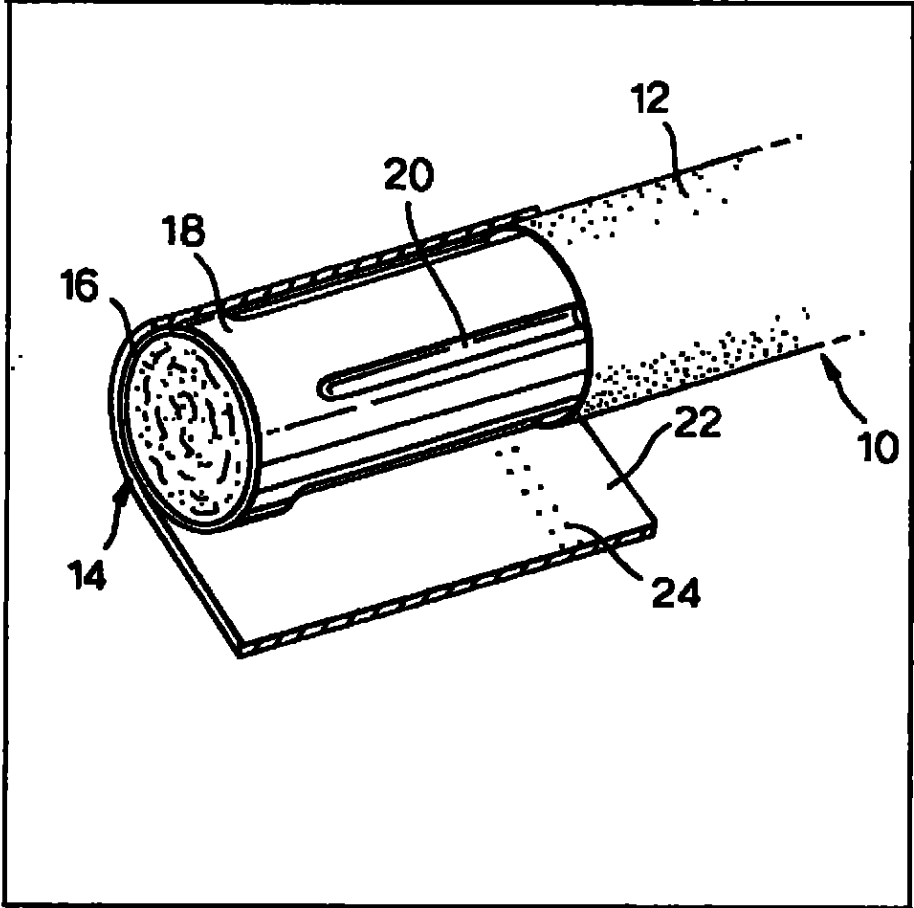
**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/GB02/05603

- 1). The present application does not meet the requirements of Article 33(2) PCT, because the subject-matter of claims 23 and 24 is not new over GB2136669 (see fig. 2). This document teaches a corrugated plug wrap which forms grooves; the corrugated surface forming grooves is also visible on the filter plug itself (see fig. 4).
- 2). The present application does not meet the requirements of Article 33(2) PCT, because the subject-matter of claim 1 is not new over GB2136669, see fig.2.
- 3). The filter material in the above mentioned document is fibrous cellulose acetate, which is homogeneous. The grooves are distributed symmetrically and are V- or U-shaped.
The additional features of claims 16-18 are also known from this document, see p. 1, l. 18-24.
- 4). Dependent claim 19 does not contain any features which, in combination with the features of any claim to which it refers, meet the requirements of the PCT in respect of inventive step.

ARTE FINAL 12 x 12

TITULO: ARTÍCULO PARA FUMAR VENTILADO.



PCT

REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference
(if desired) (12 characters maximum) RD-BAT-10

Box No. I TITLE OF INVENTION	
Ventilated Smoking Article	
Box No. II APPLICANT ☐ This person is also inventor	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)	
British American Tobacco (Investments) Limited Globe House 1 Water Street London WC2R 3LA United Kingdom	
Telephone No.	
Facsimile No.	
Teleprinter No.	
Applicant's registration No. with the Office 07515778003	
State (that is, country) of nationality: GB	State (that is, country) of residence: GB
This person is applicant for the purposes of: ☐ all designated States ☒ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box	
Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)	
SCHLÜTER Dr. Adolf Böhlstrasse 26 95448 Eckersdorf Germany	
This person is: ☐ applicant only ☒ applicant and inventor ☐ inventor only (If this check-box is marked, do not fill in below.)	
Applicant's registration No. with the Office	
State (that is, country) of nationality: DE	State (that is, country) of residence: DE
This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box	
☒ Further applicants and/or (further) inventors are indicated on a continuation sheet.	
Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE	
The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: ☒ agent ☐ common representative	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)	
WALFORD Margot Ruth Patents Department British American Tobacco R&D Centre Regents Park Road Southampton SO15 8TL United Kingdom	
Telephone No. +44 2380 777 155	
Facsimile No. +44 2380 779 856	
Teleprinter No.	
Agent's registration No. with the Office	
☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.	

4114461
63

Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S) <i>If none of the following sub-boxes is used, this sheet should not be included in the request.</i>	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</i> GRZONKA Horst Braucgasse 1 (Obernscees) 95490 Mistelgau Germany	This person is: ☐ applicant only ☒ applicant and inventor ☐ inventor only <i>(If this check-box is marked, do not fill in below.)</i> Applicant's registration No. with the Office
State <i>(that is, country)</i> of nationality: DE	State <i>(that is, country)</i> of residence: DE
This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</i>	This person is: ☐ applicant only ☐ applicant and inventor ☐ inventor only <i>(If this check-box is marked, do not fill in below.)</i> Applicant's registration No. with the Office
State <i>(that is, country)</i> of nationality:	State <i>(that is, country)</i> of residence:
This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</i>	This person is: ☐ applicant only ☐ applicant and inventor ☐ inventor only <i>(If this check-box is marked, do not fill in below.)</i> Applicant's registration No. with the Office
State <i>(that is, country)</i> of nationality:	State <i>(that is, country)</i> of residence:
This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box	
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)</i>	This person is: ☐ applicant only ☐ applicant and inventor ☐ inventor only <i>(If this check-box is marked, do not fill in below.)</i> Applicant's registration No. with the Office
State <i>(that is, country)</i> of nationality:	State <i>(that is, country)</i> of residence:
This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box	
☐ Further applicants and/or (further) inventors are indicated on another continuation sheet.	

Box No. V DESIGNATION OF STATES *Mark the applicable check-boxes below; at least one must be marked.*

The following designations are hereby made under Rule 4.9(a):

Regional Patent

- ☐ **AP** ARIPO Patent: GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, MZ Mozambique, SD Sudan, SL Sierra Leone, SZ Swaziland, TZ United Republic of Tanzania, UG Uganda, ZM Zambia, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT (if other kind of protection or treatment desired, specify on dotted line)
- ☐ **EA** Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☐ **EP** European Patent: AT Austria, BE Belgium, BG Bulgaria, CH & LI Switzerland and Liechtenstein, CY Cyprus, CZ Czech Republic, DE Germany, DK Denmark, EE Estonia, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, SK Slovakia, TR Turkey, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☐ **OA** OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GQ Equatorial Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

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- | | | |
|--|---|---|
| ☐ AE United Arab Emirates | ☐ GM Gambia | ☐ NZ New Zealand |
| ☐ AG Antigua and Barbuda | ☐ HR Croatia | ☐ OM Oman |
| ☐ AL Albania | ☐ HU Hungary | ☐ PH Philippines |
| ☐ AM Armenia | ☐ ID Indonesia | ☐ PL Poland |
| ☐ AT Austria | ☐ IL Israel | ☐ PT Portugal |
| ☐ AU Australia | ☐ IN India | ☐ RO Romania |
| ☐ AZ Azerbaijan | ☐ IS Iceland | ☐ RU Russian Federation |
| ☐ BA Bosnia and Herzegovina | ☐ JP Japan | |
| ☐ BB Barbados | ☐ KE Kenya | ☐ SD Sudan |
| ☐ BG Bulgaria | ☐ KG Kyrgyzstan | ☐ SE Sweden |
| ☐ BR Brazil | ☐ KP Democratic People's Republic of Korea | ☐ SG Singapore |
| ☐ BY Belarus | ☐ KR Republic of Korea | ☐ SI Slovenia |
| ☐ BZ Belize | ☐ KZ Kazakhstan | ☐ SK Slovakia |
| ☐ CA Canada | ☐ LC Saint Lucia | ☐ SL Sierra Leone |
| ☐ CH & LI Switzerland and Liechtenstein | ☐ LK Sri Lanka | ☐ TJ Tajikistan |
| ☐ CN China | ☐ LR Liberia | ☐ TM Turkmenistan |
| ☐ CO Colombia | ☐ LS Lesotho | ☐ TN Tunisia |
| ☐ CR Costa Rica | ☐ LT Lithuania | ☐ TR Turkey |
| ☐ CU Cuba | ☐ LU Luxembourg | ☐ TT Trinidad and Tobago |
| ☐ CZ Czech Republic | ☐ LV Latvia | |
| ☐ DE Germany | ☐ MA Morocco | ☐ TZ United Republic of Tanzania |
| ☐ DK Denmark | ☐ MD Republic of Moldova | ☐ UA Ukraine |
| ☐ DM Dominica | ☐ MG Madagascar | ☐ UG Uganda |
| ☐ DZ Algeria | ☐ MK The former Yugoslav Republic of Macedonia | ☐ US United States of America |
| ☐ EC Ecuador | ☐ MN Mongolia | ☐ UZ Uzbekistan |
| ☐ EE Estonia | ☐ MW Malawi | ☐ VN Viet Nam |
| ☐ ES Spain | ☐ MX Mexico | ☐ YU Yugoslavia |
| ☐ FI Finland | ☐ MZ Mozambique | ☐ ZA South Africa |
| ☐ GB United Kingdom | ☐ NO Norway | ☐ ZM Zambia |
| ☐ GD Grenada | | ☐ ZW Zimbabwe |
| ☐ GE Georgia | | |
| ☐ GH Ghana | | |

Check-boxes below reserved for designating States which have become party to the PCT after issuance of this sheet:

- ☐ VC Saint Vincent
- ☐
- ☐

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation (including fees) must reach the receiving Office within the 15-month time limit.)

Box No. V DESIGNATION OF STATES

Mark the applicable check-boxes below; at least one must be marked.

The following designations are hereby made under Rule 4.9(a):

Regional Patent

- ☒ **AP** ARIPO Patent: GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, MZ Mozambique, SD Sudan, SL Sierra Leone, SZ Swaziland, TZ United Republic of Tanzania, UG Uganda, ZM Zambia, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT (if other kind of protection or treatment desired, specify on dotted line)
- ☒ **EA** Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ **EP** European Patent: AT Austria, BE Belgium, CH & LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, TR Turkey, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ **OA** OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GQ Equatorial Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line)

National Patent (if other kind of protection or treatment desired, specify on dotted line):

- | | | |
|---|--|--|
| ☒ AE United Arab Emirates | ☒ GM Gambia | ☒ NZ New Zealand |
| ☒ AG Antigua and Barbuda | ☒ HR Croatia | ☒ OM Oman |
| ☒ AL Albania | ☒ HU Hungary | ☒ PH Philippines |
| ☒ AM Armenia | ☒ ID Indonesia | ☒ PL Poland |
| ☒ AT Austria | ☒ IL Israel | ☒ PT Portugal |
| ☒ AU Australia | ☒ IN India | ☒ RO Romania |
| ☒ AZ Azerbaijan | ☒ IS Iceland | ☒ RU Russian Federation |
| ☒ BA Bosnia and Herzegovina | ☒ JP Japan | |
| ☒ BB Barbados | ☒ KE Kenya | ☒ SD Sudan |
| ☒ BG Bulgaria | ☒ KG Kyrgyzstan | ☒ SE Sweden |
| ☒ BR Brazil | ☒ KP Democratic People's Republic of Korea | ☒ SG Singapore |
| ☒ BY Belarus | ☒ KR Republic of Korea | ☒ SI Slovenia |
| ☒ BZ Belize | ☒ KZ Kazakhstan | ☒ SK Slovakia |
| ☒ CA Canada | ☒ LC Saint Lucia | ☒ SL Sierra Leone |
| ☒ CH & LI Switzerland and Liechtenstein | ☒ LK Sri Lanka | ☒ TJ Tajikistan |
| ☒ CN China | ☒ LR Liberia | ☒ TM Turkmenistan |
| ☒ CO Colombia | ☒ LS Lesotho | ☒ TN Tunisia |
| ☒ CR Costa Rica | ☒ LT Lithuania | ☒ TR Turkey |
| ☒ CU Cuba | ☒ LU Luxembourg | ☒ TT Trinidad and Tobago |
| ☒ CZ Czech Republic | ☒ LV Latvia | |
| ☒ DE Germany | ☒ MA Morocco | ☒ TZ United Republic of Tanzania |
| ☒ DK Denmark | ☒ MD Republic of Moldova | ☒ UA Ukraine |
| ☒ DM Dominica | ☒ MG Madagascar | ☒ UG Uganda |
| ☒ DZ Algeria | ☒ MK The former Yugoslav Republic of Macedonia | ☒ US United States of America |
| ☒ EC Ecuador | ☒ MN Mongolia | ☒ UZ Uzbekistan |
| ☒ EE Estonia | ☒ MW Malawi | ☒ VN Viet Nam |
| ☒ ES Spain | ☒ MX Mexico | ☒ YU Yugoslavia |
| ☒ FI Finland | ☒ MZ Mozambique | ☒ ZA South Africa |
| ☒ GB United Kingdom | ☒ NO Norway | ☒ ZM Zambia |
| ☒ GD Grenada | | ☒ ZW Zimbabwe |
| ☒ GE Georgia | | |
| ☒ GH Ghana | | |

Check-boxes below reserved for designating States which have become party to the PCT after issuance of this sheet:

- ☒ VC St. Vincent ☒ SC Seychelles ☐
- ☐ ☐

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation (including fees) must reach the receiving Office within the 15-month time limit.)

Box No. VI PRIORITY CLAIM				
The priority of the following earlier application(s) is hereby claimed:				
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application:* regional Office	international application: receiving Office
item (1) (18.12.2001) 18 December 2001	01129382.6		EP	
item (2)				
item (3)				
item (4)				
item (5)				
☐ Further priority claims are indicated in the Supplemental Box.				
The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of this international application is the receiving Office) identified above as: ☐ all items ☐ item (1) ☐ item (2) ☐ item (3) ☐ item (4) ☐ item (5) ☐ other, see Supplemental Box				
* Where the earlier application is an ARIPO application, indicate at least one country party to the Paris Convention for the Protection of Industrial Property or one Member of the World Trade Organization for which that earlier application was filed (Rule 4.10(b)(ii)):				
Box No. VII INTERNATIONAL SEARCHING AUTHORITY				
Choice of International Searching Authority (ISA) (If two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used): ISA / ... EP				
Request to use results of earlier search; reference to that search (If an earlier search has been carried out by or requested from the International Searching Authority): Date (day/month/year) Number Country (or regional Office)				
Box No. VIII DECLARATIONS				
The following declarations are contained in Boxes Nos. VIII (i) to (v) (mark the applicable check-boxes below and indicate in the right column the number of each type of declaration):				Number of declarations
☐ Box No. VIII (i)	Declaration as to the identity of the inventor	:		
☒ Box No. VIII (ii)	Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent	:	1	
☒ Box No. VIII (iii)	Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application	:	1	
☒ Box No. VIII (iv)	Declaration of inventorship (only for the purposes of the designation of the United States of America)	:	1	
☐ Box No. VIII (v)	Declaration as to non-prejudicial disclosures or exceptions to lack of novelty	:		

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Box No. VIII (II) DECLARATION: ENTITLEMENT TO APPLY FOR AND BE GRANTED A PATENT

The declaration must conform to the standardized wording provided for in Section 212; see Notes to Boxes Nos. VIII, VIII (i) to (v) (in general) and the specific Notes to Box No. VIII (ii). If this Box is not used, this sheet should not be included in the request.

Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent (Rules 4.17(ii) and 51bis.1(a)(ii)), in a case where the declaration under Rule 4.17(iv) is not appropriate:

Combined declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent (Rules 4.17(ii) and 51bis.1(a)(ii)) and as to the identity of the inventor (Rules 4.17(i) and 51bis.1(a)(i)), in a case where the declaration under Rule 4.17(iv) is not appropriate:
in relation to this international application,

BRITISH AMERICAN TOBACCO (INVESTMENTS) LIMITED is entitled to apply for and be granted a patent by virtue of the following:

(i) SCHLÜTER Dr. Adolf of Bülhstrasse 26, 95448 Eckersdorf, Germany , a German citizen;
and
GRZONKA Horst of Brauergasse 1 (Oberrsees), 95490 Mistelgau, Germany, a German citizen
are the inventors of the subject matter for which protection is sought by way of this international application

(ii) BRITISH AMERICAN TOBACCO (INVESTMENTS) LIMITED is entitled to apply for and be granted a patent by virtue of the following:

British American Tobacco (Germany) GmbH was entitled as employer of the inventors SCHLÜTER Dr. Adolf and GRZONKA Horst;

an assignment from British American Tobacco (Germany) GmbH to BRITISH AMERICAN TOBACCO (INVESTMENTS) LIMITED dated 3 December 2002

this declaration is made for the purposes of all designations except the designation of the United States of America.

☐ This declaration is continued on the following sheet, "Continuation of Box No. VIII (II)".

Box No. VIII (III) DECLARATION: ENTITLEMENT TO CLAIM PRIORITY

The declaration must conform to the standardized wording provided for in Section 213; see Notes to Boxes Nos. VIII, VIII (I) to (V) (in general) and the specific Notes to Box No. VIII (III). If this Box is not used, this sheet should not be included in the request.

Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application specified below, where the applicant is not the applicant who filed the earlier application or where the applicant's name has changed since the filing of the earlier application (Rules 4.17(iii) and 51bis.1(a)(iii)):

in relation to this international application,

BRITISH AMERICAN TOBACCO (INVESTMENTS) LIMITED is entitled to claim priority of earlier application No. EP01129382.6 filed on 18 December 2001 entitled "Filter für einen rauchbaren Artikel" by virtue of the following:

British American Tobacco (Germany) GmbH was entitled as employer of the inventors SCHLÜTER Dr. Adolf and GRZONKA Horst;

an assignment from British American Tobacco (Germany) GmbH to BRITISH AMERICAN TOBACCO (INVESTMENTS) LIMITED dated 3 December 2002

this declaration is made for the purposes of all designations.

☐ This declaration is continued on the following sheet, "Continuation of Box No. VIII (iii)".

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For receiving Office use only

For International Bureau use only

PCT

FEE CALCULATION SHEET

Annex to the Request

For receiving Office use only

International Application No.

Date stamp of the receiving Office

Applicant's or agent's
file reference

RD-BAT-10

Applicant

British American Tobacco (Investments) Limited

CALCULATION OF PRESCRIBED FEES

1. TRANSMITTAL FEE	£55	T
2. SEARCH FEE	£592	S
International search to be carried out by _____ (If two or more International Searching Authorities are competent to carry out the international search, indicate the name of the Authority which is chosen to carry out the international search.)		
3. INTERNATIONAL FEE		
Basic Fee		
Where item (b) of Box No. IX applies, enter Sub-total number of sheets	24	
Where item (b) of Box No. IX does not apply, enter Total number of sheets		
b1 first 30 sheets	£278	b1
b2 <u>0</u> x <u>£6</u> = <u>£0</u>		b2
number of sheets in excess of 30 fee per sheet		
b3 additional component (only if sequence listing part of description is filed in computer readable form under Section 801(a)(i), or both in that form and on paper, under Section 801(a)(ii)):		
400 x _____ = _____		b3
fee per sheet		
Add amounts entered at b1, b2 and b3 and enter total at B	£278	B
Designation Fees		
The international application contains <u>94</u> designations.		
<u>5</u> x <u>£60</u> = <u>£300</u>		D
number of designation fees payable (maximum 5) amount of designation fee		
Add amounts entered at B and D and enter total at I	£578	I
(Applicants from certain States are entitled to a reduction of 75% of the international fee. Where the applicant is (or all applicants are) so entitled, the total to be entered at I is 25% of the sum of the amounts entered at B and D.)		
4. FEE FOR PRIORITY DOCUMENT (if applicable)		P
5. TOTAL FEES PAYABLE	£1,225	
Add amounts entered at T, S, I and P, and enter total in the TOTAL box	TOTAL	

☐ The designation fees are not paid at this time.

MODE OF PAYMENT

☒ authorization to charge deposit account (see below) ☐ postal money order ☐ cash ☐ coupons
☐ cheque ☐ bank draft ☐ revenue stamps ☐ other (specify):

AUTHORIZATION TO CHARGE (OR CREDIT) DEPOSIT ACCOUNT

(This mode of payment may not be available at all receiving Offices)

☒ Authorization to charge the total fees indicated above.
☒ (This check-box may be marked only if the conditions for deposit accounts of the receiving Office so permit) Authorization to charge any deficiency or credit any overpayment in the total fees indicated above.
☐ Authorization to charge the fee for priority document.

Receiving Office: RO/ _____ GB
 Deposit Account No.: _____ D01886
 Date: _____
 Name: Margot Ruth WALFORD
 Signature: _____

From the INTERNATIONAL BUREAU

PCT

NOTICE INFORMING THE APPLICANT OF THE
COMMUNICATION OF THE INTERNATIONAL
APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

To:

WALFORD, Margaret, Ruth
Patents Department
British American Tobacco R&D Centre
Regents Park Road PATENTS DEPT.
Southampton SO15 8TL
ROYAUME-UNI

Date of mailing (day/month/year) 26 June 2003 (26.06.03)		
Applicant's or agent's file reference RD-BAT-10		IMPORTANT NOTICE
International application No. PCT/GB02/05603	International filing date (day/month/year) 11 December 2002 (11.12.02)	Priority date (day/month/year) 18 December 2001 (18.12.01)
Applicant BRITISH AMERICAN TOBACCO (INVESTMENTS) LIMITED		

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this notice:

CH, EP, KP, KR, US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

AE, AG, AL, AM, AP, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EA, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OA, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW

The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this notice is a copy of the international application as published by the International Bureau on 26 June 2003 (26.06.03) under No. 03/051144

4. **TIME LIMITS** for filing a demand for international preliminary examination and for entry into the national phase

The applicable time limit for entering the national phase will, subject to what is said in the following paragraph, be 30 MONTHS from the priority date, not only in respect of any elected Office if a demand for international preliminary examination is filed before the expiration of 19 months from the priority date, but also in respect of any designated Office, in the absence of filing of such demand, where Article 22(1) as modified with effect from 1 April 2002 applies in respect of that designated Office. For further details, see *PCT Gazette* No. 44/2001 of 1 November 2001, pages 19926, 19932 and 19934, as well as the *PCT Newsletter*, October and November 2001 and February 2002 issues.

In practice, time limits other than the 30-month time limit will continue to apply, for various periods of time, in respect of certain designated or elected Offices. For regular updates on the applicable time limits (20, 21, 30 or 31 months, or other time limit), Office by Office, refer to the *PCT Gazette*, the *PCT Newsletter* and the *PCT Applicant's Guide*, Volume II, National Chapters, all available from WIPO's Internet site, at <http://www.wipo.int/pct/en/index.html>.

For filing a demand for international preliminary examination, see the *PCT Applicant's Guide*, Volume I/A, Chapter IX. Only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination (at present, all PCT Contracting States are bound by Chapter II).

It is the applicant's sole responsibility to monitor all these time limits.

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Judith Zahra
Facsimile No. (41-22) 740.14.35	Telephone No. (41-22) 338.91.11

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ASSIGNMENT

We British American Tobacco (Germany) GmbH incorporated under the laws of Germany, whose postal address is Alsterufer 4, D-20354 Hamburg, Germany and who by virtue of contract of employment from the inventors Dr. Adolf Schlüter and Horst Grzonka have ownership of the invention entitled

"Ventilated Smoking Article" filed at the European Patent Office on 18 December 2001 under number EP01129382.6 entitled "Filter für einen rauchbaren Artikel" hereby assign all right, title and interest for convention patent filings based on said EP Patent

Application belonging to us, including the right to claim priority from said EP Patent

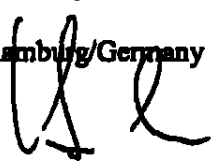
Application to **BRITISH AMERICAN TOBACCO (INVESTMENTS) LIMITED** a

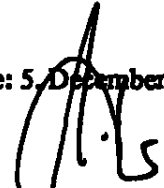
Company incorporated under the laws of England & Wales, whose registered address is Globe House, 1 Water Street, London WC2R 3LA, United Kingdom for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged.

It is hereby certified that the transaction hereby effected does not form part of a larger transaction or series of transactions in respect of which the amount or value, or aggregate amount or value, of the consideration exceeds £60,000.

Place: Hamburg/Germany

Date: 5. December 2002


Jonny Bülow


Nikolaus Mohr

Signature on behalf of British American Tobacco (Germany) GmbH

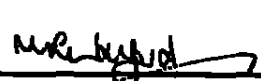
Name: Jonny Bülow
Nikolaus Mohr

Position: Director
Director

Witness:

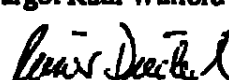
British American Tobacco (Investments) Limited hereby accepts this Assignment.

Place: Southampton, United Kingdom


Signature on behalf of British American Tobacco (Investments) Limited

Name: Margot Ruth Walford

Position: Assistant Secretary

Witness: 
REINER DIETRICH

REQUISITOS NECESARIOS PARA PRESENTACION Y AGILIZACION DEL TRAMITE

	USUARIO	RADICADOR
PATENTE DE INVENCION (X) MODELO DE UTILIDAD	()	()
- Indicación de que se solicita la concesión de una patente.	(X)	()
- Datos de identificación del solicitante o de la persona que presenta la solicitud.	(X)	()
- Descripción de la invención.	(X)	()
- Dibujos de ser estos pertinentes.	(X)	()
- Comprobante de Pago de las tasas establecidas. (X)		
COMPLETA (X) INCOMPLETA ()		

DISEÑO INDUSTRIAL ()

- Indicación de que se solicita el registro de Diseño Industrial	()	()
- Datos de identificación del solicitante o de la persona que presenta la solicitud.	()	()
- Representación gráfica y fotográfica del Diseño Industrial o muestra del Material que incorpora el diseño.	()	()
- Comprobante de pago de las tasas establecidas	()	()
COMPLETA () INCOMPLETA ()		

ESQUEMA DE TRAZADO ()

- Indicación de que solicita el registro de un Esquema de trazado.	()	()
- Datos de identificación del solicitante o de la persona que presenta La solicitud.	()	()
- Representación gráfica del esquema de trazado	()	()
- Comprobante de pago de las tasas establecidas.	()	()
COMPLETA () INCOMPLETA ()		

Firma Responsable:

Fecha: Bogotá, Junio 18 de 2004.

SUPERINDUSTRIA Y COMERCIO

Radicación : 04057551 00000000

Folios: 70

Fecha (SIB): 2004-06-18 17:01:28

Trámite : 011 PCT-PATENT 379 FASE INCI 411 PRESENTAC

Dependencia: 2029 DIVISION DE NUEVAS CREACIONES

2020
Bogotá D C

Doctor(a)
ALVARO CORREA ORDOÑEZ.
Apoderado(a)

Oficio N° 05636

ASUNTO:	Radicación N°	04-57551
	Solicitud internacional	PCT/GB02/05603
	Fecha inicio fase nacional	18/07/2004
	Trámite	011
	Evento	379
	Actuación	416
	Oficio N°	
	Folios	001

Como resultado del examen de forma, realizado con fundamento en el artículo 38 de la Decisión 486 de la Comisión de la Comunidad Andina, artículo 27 del Tratado de Cooperación en Materia de Patentes (PCT), regla 51 bis del Reglamento y Circular Única de la Superintendencia de Industria y Comercio, se le comunica que:

- La solicitud no contiene la traducción de los anexos del reporte de examen preliminar internacional. (Art. 36.2.b) del tratado PCT).

En cumplimiento de lo dispuesto por el artículo 39 de la Decisión 486, se le requiere para que dentro del término de dos meses siguientes a la fecha de notificación del presente oficio, complete los requisitos anteriormente enunciados. En caso de no dar cumplimiento al presente requerimiento, la solicitud se considerará abandonada y perderá su prelación.

Notifíquese el presente oficio conforme a lo dispuesto en el numeral 5.2, literal e), del capítulo quinto del título primero de la Circular Única N° 10 de 2001.


ALIX CARMENZA GESPEDES DE VERGEL
Jefe de la División de Nuevas Creaciones.

El anterior requerimiento fue notificado por fijación en lista de fecha, 16 JUL. 2004
202051