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(54) SMOKING ARTICLE

RAUCHARTIKEL

ARTICLE POUR FUMEUR

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Description

[0001] This invention relates to smoking articles and in particular to an enclosed smoking article.

[0002] The object of the invention is to cut down on or prevent entirely sidestream smoke particles escaping into the ambient atmosphere thus eliminating one of the major causes of annoyance to non-smokers. We aim also to retain the ash which falls from the rod - another cause of annoyance. The structure also allows for the safe disposal of the article if it is self-extinguishing or is held to a low external temperature.

[0003] In US-A-4685477 a cigarette-holder is disclosed which forms a porous enclosure around the tobacco rod of the cigarette. A cylindrical wall of the enclosure has a filter in it which may act as an adsorbent. Once the cigarette has burnt down somewhat, it is supported only at one end.

[0004] This is achieved according to the invention in that the rod of smokable material such as the tobacco rod of a cigarette, cigarillo or cigar (hereinafter "tobacco rod") is permanently mounted within and spaced from a wall which is of a closable container which is at least partly porous and which has various functions within a protective outer shell formed by the wall.

One end of the rod is accessible for smoking (hereinafter called the mouth end).

[0005] Preferably the chamber wall is a cylinder in which the smokable rod is mounted coaxially with its mouth end flush with or projecting from one end of the cylinder; at the other end of the cylinder there will be a closure. This may be removable and/or may allow access for lighting the smokable article. When the mouth end projects from the end of the container, air may in appropriate cases pass directly from ambient to ventilation of a filter of the smoking article, which will preferably be filtered. The filter assembly may be preassembled to the smokable rod and be mounted by mounting means to the wall or may be attached to the wall beyond one end of the smokable rod and of the container. The mounting means may themselves be permeable, e.g. be filter material, or may be impermeable such as for example closed cell foam.

[0006] There may be a plurality of layers in the wall of the sheath or container and particularly when cylindrical in the cylindrical wall, these layers having various functions. However, at least one such layer and preferably all such layers will desirably bear accessibly one or more of a catalyst, a heat insulator or an adsorbent such as activated carbon so as to act upon semi-volatiles and vapour phase components of the sidestream smoke. Any of these ingredients may have more than one of those capacities.

[0007] The outermost layer (the sole layer when only one is provided) will normally be of a stiff but porous paper.

[0008] There may be a heat-sensitive indicator band along the outermost layer so that the smoker can see that the smokable rod is alight and how far the burning area (the "coal") has progressed.

[0009] One or more of the layers will preferably be a heat insulation or dispersant layer, e.g. a fabric treated with burn-retardants, or metal foil, wire mesh or metal or metallised fibres.

[0010] The smokable rod may be self-extinguishing, this being normally provided by a band of paper incorporating a burn-retardant chemical surrounding the smoking material at or adjacent the mouth end, or placed on the inner wall of the container.

[0011] The smokable rod preferably has a wrapper formulated (as is known per se) so as to cut down on the amount of sidestream smoke generated.

[0012] The end cap of the container may be formed; by a disc of paper secured across the end; by crimping the end of the container; by providing a comparatively rigid end cap which plugs into the end of a tubular such container; by a permanent end cap having a closable aperture in it; or the aperture may be closable upon being heated, for example being lined by an intumescent paint.

[0013] The purpose of a removable end cap or of an access aperture is to allow for ignition of the smokable rod inside the container; alternatively, the container may be permanently sealed by a non-combustible material such as a fibrous material and the tobacco rod be ignited by for example electrically or by impact on a small detonator such as a non-safety match head. When the seal is a fibrous non-combustible material, ignition of the free end of the tobacco rod may be by a gas flame striking through the seal when the two are in contact.

[0014] The filter of the smokable rod can be ventilated and by regulation of the comparative permeability of the filter and of its mounting means in the container, together with ventilation of the smokable material portion of the smokable rod if desired, it can be determined what proportion of the smoke from the chamber is drawn by the smoker to be mixed with that drawn direct through the filter.

[0015] Particular embodiments of the invention will now be described with the accompanying drawings wherein

Figures 1 to 6 are respective diametrical sections through first to sixth embodiments; and

Figure 7 is an end view of an embodiment.

[0016] In the embodiments shown in Figs 1 to 4 a filter cigarette 1 is mounted with one end (free end 13) and an intermediate portion 14 of its rod of smokable material in a container 6. The cigarette is thinner and shorter than a conventional cigarette being for example 4 to 6 mm, usually 5.4 mm in diameter (as against the conventional 7.9 or 8 mm) and e.g. 60 to 90 mm, usually 72 mm, in length of which length e.g. 30 to 70 mm, usually

45 mm, is the tobacco rod 2 and e.g. 10 to 30 mm, usually 27 mm, the filter end portion 3.

[0017] The rod 2 is surrounded by the container 6 the wall 7 of which is a hollow cylinder and of which the axis 4 is coaxial with that of the rod. A mounting block 8 on one end of the rod holds the wall 7 spaced from the intermediate portion 14 and other end 13 of the rod 2. The diameter of the container will preferably be that of a conventional cigarette namely 7.9 or 8 mm and also its length will preferably be that of a conventional cigarette (70 to 120 mm).

[0018] The tobacco rod 2 is of conventional material for a "slim-line" cigarette and wrapped with conventional cigarette paper or paper of a type, known per se, adapted to cut down sidestream smoke. The filter 3 is also conventional and may have any suitable filter material and may be a single or multiple type. It is enwrapped by a conventional plug wrap and united to the tobacco rod by an overwrap.

[0019] Adjacent the join between the tobacco rod and the filter there is a band 5 of non-porous paper which has the effect of rendering the cigarette self-extinguishing.

[0020] In the first embodiment the container 6 is made up of a single layer of stiff but porous paper in the form of cylindrical tube 7. The filter 3 of the rod 2 in such a way that its mouth end is accessible through the end 9 of the container formed by one face of the block 8 and can be drawn on by a smoker.

[0021] On or accessible from the inner surface of the tube 7 are particles 10 of adsorbent materials such as activated carbon or zeolites. There is an end cap 11 which as shown is also of stiff but porous paper. It is however only necessary that part of the container be porous so for example the tube 7 could be non-porous if the end cap 11 is porous and *vice versa*.

[0022] It is seen that the rod 2 is mounted so that its intermediate portion and one end are free of the walls of the container and a chamber 12 is formed around it.

[0023] To light the rod the end cap 11 is removed and a match or the like applied conventionally to the free end of the rod. Once it is burning the end cap is replaced. Alternatively the end cap may be permanently secured and internal means of ignition such as in particular a small charge of a detonator such as a non-safety phosphorus match mixture may be provided to ignite the free end of the rod.

[0024] When the smokable material is smouldering (i.e. not being drawn on by the smoker) sidestream smoke is contained in the chamber 12 and no particulate material should be able to escape from it. Some volatiles may penetrate through the porosity of the container wall but many of them, as well as the semi-volatiles and the particulates should be adsorbed by the material 10.

[0025] When the smokable rod is drawn on by the smoker there is a conventional flow of smoke through the filter 3. In these embodiments, if the block 8 is of a porous material the smoker may also draw some of the sidestream smoke from the chamber 12 and the relative proportions of the two smokes drawn can be adjusted by the relative porosity of block 8 and filter 3. If the block 8 is impermeable, some sidestream smoke may be drawn back past the coal and through the rod 2 and filter 3.

[0026] The spacing of the tube 7 from the rod 2 provides heat insulation so that not only does the assembly cut down on sidestream particulates but may be able to be rested on an ordinary surface while the cigarette is smouldering. However in the third embodiment, to be described, means are shown which will greatly increase the efficiency of the heat insulation effect.

[0027] Figure 1 also shows how the filter 3 may be ventilated as at 17 so as further to allow adjustment of the ratios of sidestream and mainstream smoke drawn by the user.

[0028] Figure 2 shows a modification wherein a container 15 has a tube 7 internally coated by adsorbent 10 as before and also as before the cigarette 1 is mounted by a block 8 to be accessible at one end of the tube.

[0029] Here however the closure cap is a moulded plastics plug 16 which the user fits into the end of the tube 7 once he has lit the cigarette. The plug 16 need not of course be entirely of plastics material but may be for example a ring of plastics bearing a web of paper, which may be porous, across its central void.

[0030] Figure 3 shows the third embodiment, wherein the container 20 has a plurality of wall layers. An outermost is a protective tube 7 of stiff paper the internal surface of which may or may not have an absorbent layer such as 10. Within this and preferably narrowly spaced from it is an inner tubular layer 21.

[0031] There is also provided a third layer being an innermost layer 22. If paper 7 is porous then so will inner layers 21 and 22 be porous.

[0032] Adsorbent material 10 such as activated carbon or zeolite is accessible from the inner surface of the innermost layer 22 being on that layer or on layer 21 or tube 7. Layer 21 is a heat insulating layer being for example filled with heat insulating material or being reflective e.g. due to metallisation. Layer 22 is a heat distributing layer having for example metallic such as a perforated foil or a mesh or metallised fibres laying within it or upon it preferably generally in the axial direction. The metallic fibres when heated may have a catalytic effect upon the vapour phase components of the smoke. If at least one but preferably both of layers 21 and 22 are provided there is less need for a major air gap between the rod 2 and the outer wall 7 while maintaining a very adequate degree of thermal insulation (for example the temperature of the outer wall will not exceed more than 150°C, preferably being in the range 60-80°C).

[0033] The cigarette 1 is mounted in a block 23 analogous to block 8 and layers 22, 21 and 7 are spaced therefrom and from each other by comparatively thick

adhesive layers 24, 25.

[0034] There can be a removable end cap such as 16 or as illustrated here the papers of the three layers 7, 21 and 22 are brought together at 26.

[0035] They may be permanently secured together there e.g. by crimping or adhesion or may offer an aperture for temporary access to the free end of the cigarette to allow it to be lit, thereafter being closed together either by the user by a clip or band or by for example the application of a layer of intumescent paint 27 to the relevant region of the innermost layer which swells to seal the aperture under the influence of the heat from the rod. It is clear that these expedients, as well as the use of multi-layered walls, are applicable to all embodiments.

[0036] To indicate to the user that the cigarette has remained alight, and how far the "coal" has progressed along it, a strip of a heat-sensitive colour-changing indicator material may be applied along the outermost wall 7 of any embodiment.

[0037] Further embodiments are seen in Figures 4, 5 and 6.

[0038] In the embodiment of Figure 4, the cigarette 1 of the embodiment of Figure 1 has in effect been shifted outwardly so that its mouth end 3' projects outwardly beyond the end wall 9 of the container. As shown, ventilation holes 17 are free of that end 9 and so when the smoker draws on the cigarette ventilation air will be drawn from the ambient atmosphere. Sidestream smoke from the chamber 12 will be drawn through the smokable material rod.

[0039] In the embodiments shown in Figures 5 and 6 a tobacco rod 2 is mounted in a container. The tobacco rod is thinner than in a conventional cigarette being for example 4 to 6 mm, usually 5.4 mm in diameter (as against the conventional 7.9 or 8 mm) and 30 to 90 mm in length.

[0040] In the embodiment shown in Figure 5, the filter 3" is, in effect, between the end wall 9 of the container and the mouth end 3"' of the cigarette 1'. It has in this example a multiple filter structure with filter material bands 31,32 sandwiching a cavity 30 in which may be positioned adsorbents or flavour modifying materials, such as e.g. sepiolite or carbon.

[0041] The rod 2' is mounted within the container by a block 8' combining the functions of annular mounting block 8 and extinguishing paper 5.

[0042] In any of the embodiments so far disclosed and described, the absolute and relative lengths both of the mouth end structure of the container i.e. that occupied by mounts 8,23,5' and of the chamber can be modified. Figure 6 shows one such possible arrangement, where the annular mounting block of any of the previous embodiments extends for (for example) 40 mm from the end 9 of the assembly, the chamber extending for example a further 60 mm, giving a total length to the article of 100 mm. The expedient of lengthening the block or other inert portion 8 (or for example 23 or 5') is that the smoker has more space within which to handle the cigarette without running any risk of coming in contact with heated surfaces.

[0043] Figure 7 is a cross-section through, in principle, any of the embodiments previously described showing how any could have a multi-layer wall 33,34,35, such as layers 7,21,22 of Figure 3, spaced by the chamber 12 from the smoking rod 2. These layers may be separately assembled but may be preassembled as a laminate before the formation of the container or sheath.

[0044] To summarize, in a preferred embodiment, a smoking article with a tobacco rod shorter and thinner than a conventional tobacco rod is used to reduce the quantity of heat generated upon smoking and also to reduce the quantities of sidestream smoke components generated.

[0045] The tobacco rod has a wrapping of a cigarette paper which is preferably a fast-burning cigarette paper selected to minimise the risk that the cigarette will self-extinguish when smouldering. This rod is surrounded by a container which is a hollow cylinder (7.9 or 8 mm diameter) and of which the axis is coaxial with that of the cigarette.

[0046] The filter is of a conventional type with the addition of an adsorbent to reduce the vapour phase fraction of sidestream smoke components which in use may be drawn through the cigarette wrapper or through the "coal".

[0047] The join between filter and tobacco rod is made by overwrapping with a non-combustible paper to render the cigarette self-extinguishing.

[0048] The material of the container wall has a low porosity and contains activated charcoal to reduce the vapour phase components of the sidestream smoke and the material also includes a mineral filler to provide thermal mass to reduce the temperature of the cylinder wall to less than 150°C, preferably less than 120°C and most preferably to less than 80°C.

Claims

1. A smoking article having a smokable rod with two end portions (3,3',3"',13) and an intermediate portion (14) and mounting means (8,8') on one of the end portions (3,3',3"') thereof mounting a wall (7) of an enclosure (6) to surround and be spaced from the intermediate portion (14) and the other of the end portions (13) of the smokable rod, at least part of the wall of the enclosure being porous to permit combustion of material of the smokable rod within the chamber formed by the enclosure, with the end of the one end portion (3,3',3"') of the smokable rod being accessible, characterized in that the mounting means (8,8') permanently mount the wall (7) and maintain the smokable rod spaced from the wall and in that the wall (7) provides inside a protective tube (7) at least one of heat dissipation, heat insulator and adsorption functions.

2. A smoking article according to claim 1 wherein the one end portion (3,3') of the smokable rod is a filter.

3. A smoking article according to claim 2 wherein the filter (3) is ventilated (17) within the enclosure.

4. A smoking article according to claim 2 wherein the filter (3') is ventilated (17) outside the enclosure, with the filter projecting beyond an end (9) of the enclosure.

5. A smoking article according to claim 1 wherein a filter (3") is provided beyond the one end portion (3"") of the smokable rod and outside the enclosure (6).

6. A smoking article according to any one of the preceding claims wherein the end of the enclosure remote from the end at which the one end of the smokable rod is accessible is closed by a removable closure (11,16).

7. A smoking article according to any one of the preceding claims wherein the end (26) of the enclosure remote from the end at which the one end of the smokable rod is accessible is permanently closed.

8. A smoking article according to any one of the preceding claims wherein the end (26) of the enclosure remote from the end at which the one end of the smokable rod is accessible is adapted (27) to close permanently upon a rise to a predetermined temperature.

9. A smoking article according to any one of the preceding claims wherein the protective tube (7) of the enclosure includes an adsorbent layer (10) inwardly of the enclosure.

10. A smoking article according to any one of the preceding claims wherein the wall of the enclosure includes a heat insulator layer (21) within the protective tube (7).

11. A smoking article according to claim 10 wherein the heat insulator of the heat insulator layer (21) is metallic fibres.

12. A smoking article according to any one of the preceding claims wherein the wall (7) of the enclosure includes a catalyst.

13. A smoking article according to any one of the preceding claims wherein the smokable rod has self-extinguishing means (5,8') adjacent its one end.

14. A smoking article according to any one of the preceding claims wherein the wall of the enclosure includes a visible heat-sensitive indicator extending along the enclosure to indicate the position of the coal of a burning smokable rod.

15. A smoking article according to any one of claims 1 to 8 wherein the wall of the enclosure includes an adsorbent ingredient (10) and at least one of a heat insulator (21) and a heat dissipator (22) ingredient.

16. A smoking article according to claim 15 wherein the wall has a plurality of layers (7,21,22), an outer layer (7) being the protective shell and the said ingredients being distributed among inner layers.

Patentansprüche

1. Rauchartikel, der ein rauchbares Stäbchen mit zwei Endabschnitten (3, 3', 3"', 13) und einem Mittelabschnitt (14) sowie Befestigungsmitteln (8,8') an einem der Endabschnitte (3,3',3"') davon, an denen eine Wand (7) einer Hülle (6) so montiert ist, daß sie den Mittelabschnitt (14) und den anderen der Endabschnitte (13) des rauchbaren Stäbchens umgibt und davon beabstandet ist, wobei zumindest ein Teil der Wand der Hülle porös ist, um das Verbrennen von Material des rauchbaren Stäbchens innerhalb der von der Hülle gebildeten Kammer zuzulassen, wobei das Ende des einen Endabschnitts (3, 3', 3"') des rauchbaren Stäbchens zuganglich ist, dadurch gekennzeichnet, daß die Wand (7) durch die Befestigungsmittel (8,8') permanent montiert ist und sie das rauchbare Stäbchen von der Wand beabstandet halten, und daß die Wand (7) innerhalb eines Schutzröhrchens (7) zumindest eine aus Wärmeableitungs-, Wärmeisolator- und Adsorptionsfunktionen bietet.

2. Rauchartikel nach Anspruch 1, worin der eine Endabschnitt (3,3') des rauchbaren Stäbchens ein Filter ist.

3. Rauchartikel nach Anspruch 2, worin der Filter (3) innerhalb der Hülle belüftet (17) ist.

4. Rauchartikel nach Anspruch 2, worin der Filter (3') außerhalb der Hülle belüftet (17) ist, wobei der Filter über ein Ende (9) der Hülle hinausragt.

5. Rauchartikel nach Anspruch 1, worin ein Filter (3") jenseits des einen Endabschnitts (3"') des rauchbaren Stäbchens und außerhalb der Hülle (6) vorgesehen ist.

6. Rauchartikel nach einem der vorangegangenen Ansprüche, worin das Ende der Hülle, das von jenem Ende entfernt ist, an dem das eine Ende des rauchbaren Stäbchens zugänglich ist, mit einem abnehmbaren Verschluß (11, 16) geschlossen ist.

7. Rauchartikel nach einem der vorangegangenen Ansprüche, worin das Ende (26) der Hülle, das von jenem Ende entfernt ist, an dem das eine Ende des rauchbaren Stäbchens zugänglich ist, permanent geschlossen ist.

8. Rauchartikel nach einem der vorangegangenen Ansprüche, worin das Ende (26) der Hülle, das von jenem Ende entfernt ist, an dem das eine Ende des rauchbaren Stäbchens zugänglich ist, so ausgebildet (27) ist, daß es sich beim Anstieg auf eine vorbestimmte Temperatur permanent schließt.

9. Rauchartikel nach einem der vorangegangenen Ansprüche, worin das Schutzröhrchen (7) der Hülle innerhalb der Hülle eine adsorbierende Schicht (10) umfaßt.

10. Rauchartikel nach einem der vorangegangenen Ansprüche, worin die Wand der Hülle eine Wärmeisolatorschicht (21) innerhalb des Schutzröhrchens (7) umfaßt.

11. Rauchartikel nach Anspruch 10, worin der Wärmeisolator der Wärmeisolatorschicht (21) aus Metallfasern besteht.

12. Rauchartikel nach einem der vorangegangenen Ansprüche, worin die Wand (7) der Hülle einen Katalysator umfaßt.

13. Rauchartikel nach einem der vorangegangenen Ansprüche, worin das rauchbare Stäbchen angrenzend an sein eines Ende selbstlöschende Mittel (5, 8') aufweist.

14. Rauchartikel nach einem der vorangegangenen Ansprüche, worin die Wand der Hülle einen sichtbaren wärmeempfindlichen Indikator aufweist, der sich die Hülle entlang erstreckt, um die Position der Brennzone eines brennenden rauchbaren Stäbchens anzuzeigen.

15. Rauchartikel nach einem der Ansprüche 1 bis 8, worin die Wand der Hülle ein adsorbierendes Ingrediens (10) und zumindest eines aus wärmeisolierendem (21) und wärmeableitendem (22) Ingrediens umfaßt.

16. Rauchartikel nach Anspruch 15, worin die Wand eine Vielzahl von Schichten (7, 21, 22) aufweist, wobei eine Außenschicht (7) die Schutzhülle darstellt und die Ingredienzien auf die inneren Schichten verteilt sind.

Revendications

1. Article à fumer comportant un boudin à fumer avec deux portions d'extrémité (3, 3', 3''', 13) et une portion intermédiaire (14) et un moyen de montage (8, 8') sur l'une des portions d'extrémité (3, 3', 3''') de celui-ci, installant une paroi (7) d'une protection (6) pour entourer et être espacée de la portion intermédiaire (14) et de l'autre des portions d'extrémité (13) du boudin à fumer, au moins une partie de la paroi de la protection étant poreuse pour permettre la combustion de la substance du boudin à fumer dans la chambre formée par la protection, l'extrémité d'une portion d'extrémité (3, 3', 3''') du boudin à fumer étant accessible, caractérisé en ce que le moyen de montage (8, 8') monte d'une manière permanente la paroi (7) et maintient le boudin à fumer espacé de la paroi, et en ce que la paroi (7) réalise à l'intérieur d'un tube de protection (7) au moins l'une des fonctions de dissipation de chaleur, d'isolation de chaleur et d'absorption.

2. Article à fumer selon la revendication 1, où la portion d'extrémité précitée (3, 3') du boudin à fumer est un filtre.

3. Article à fumer selon la revendication 2, où le filtre (3) est ventilé (17) dans la protection.

4. Article à fumer selon la revendication 2, où le filtre (3') est ventilé (17) à l'extérieur de la protection, le filtre dépassant d'une extrémité (9) de la protection.

5. Article à fumer selon la revendication 1, où un filtre (3'') est prévu au-delà de la portion d'extrémité précitée (3''') du boudin à fumer et à l'extérieur de la protection (6).

6. Article à fumer selon l'une des revendications précédentes, où l'extrémité de la protection éloignée de l'extrémité à laquelle une extrémité du boudin à fumer est accessible, est fermée par une fermeture amovible (11, 16).

7. Article à fumer selon l'une des revendications précédentes, où l'extrémité (26) de la protection éloignée de l'extrémité à laquelle l'extrémité précitée du boudin à fumer est accessible, est fermée d'une manière permanente.

8. Article à fumer selon l'une des revendications précédentes, où l'extrémité (26) de la protection éloignée de l'extrémité a laquelle l'extrémité précitée du boudin à fumer est accessible, est conçue (27) pour être fermée d'une manière permanente lors d'une augmentation à une température prédéterminée.

9. Article à fumer selon l'une des revendications précédentes, où le tube de protection (7) de la protection comporte une couche d'absorption (10) vers

l'intérieur de la protection.

10. Article à fumer selon l'une des revendications précédentes, où la paroi de la protection comporte une couche calorifuge (21) dans le tube de protection (7).

11. Article à fumer selon la revendication 10, où le calorifugeage de la couche calorifuge (21) est réalisé par des fibres métalliques.

12. Article à fumer selon l'une des revendications précédentes, où la paroi (7) de la protection comporte un catalyseur.

13. Article à fumer selon l'une des revendications précédentes, où le boudin à fumer a un moyen d'autoextinction (5, 8') adjacent à une extrémité.

14. Article à fumer selon l'une des revendications précédentes, où la paroi de la protection comporte un indicateur visible sensible à la chaleur s'étendant le long de la protection pour indiquer la position de la combustion d'un boudin brûlant à fumer.

15. Article à fumer selon l'une des revendications 1 à 8, où la paroi de la protection comporte un ingrédient adsorbant (10) et au moins l'un d'un isolant thermique (21) et d'un organe de dissipation de chaleur (22).

16. Article à fumer selon la revendication 15, où la paroi comporte une pluralité de couches (7, 21, 22), une couche extérieure (7) étant la coque de protection et lesdits ingrédients étant distribués parmi les couches intérieures.

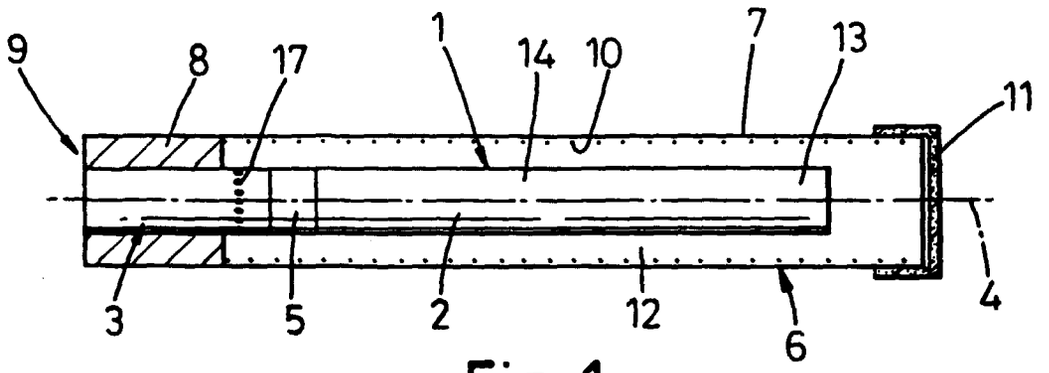

Fig. 1

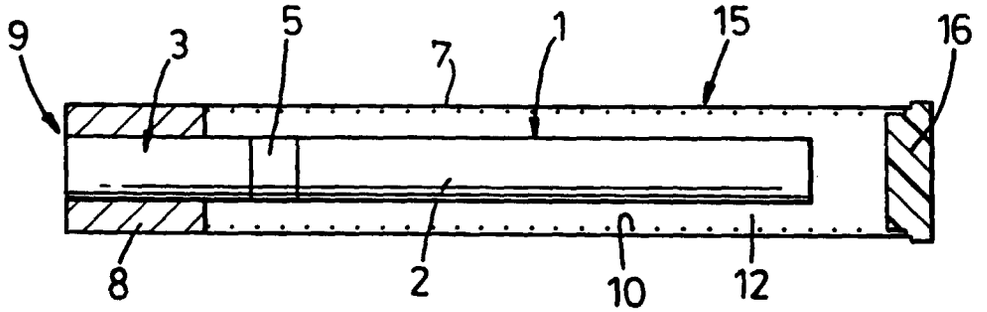

Fig. 2

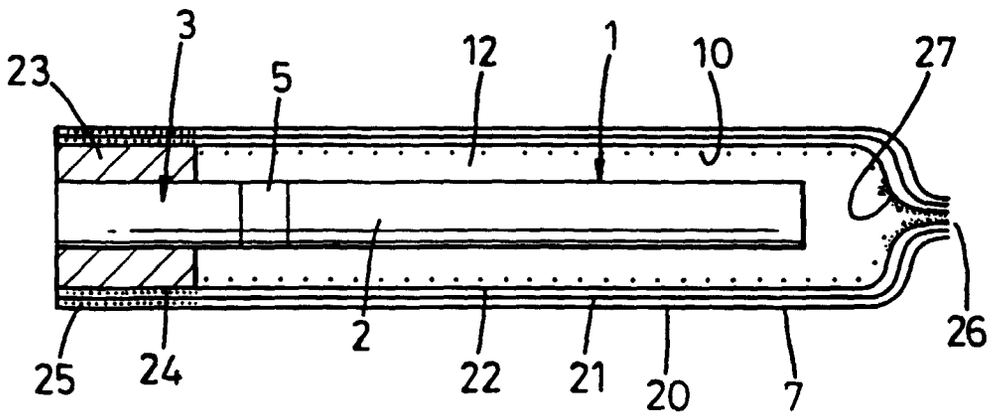

Fig. 3

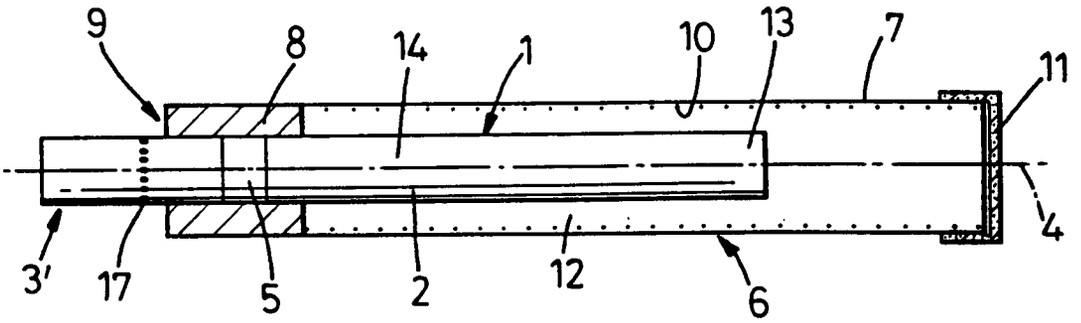

Fig. 4

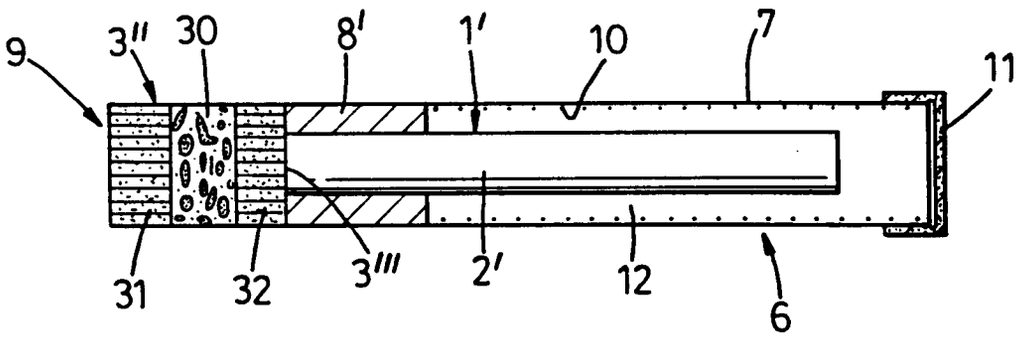

Fig. 5

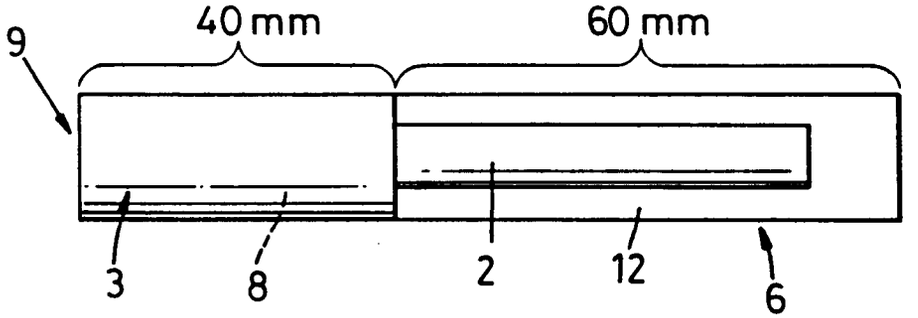

Fig. 6

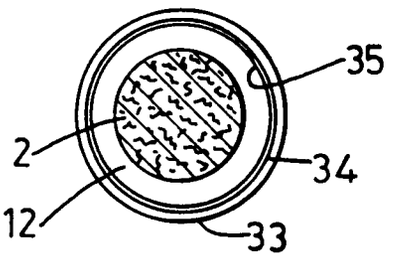

Fig. 7