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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION
TREATY (PCT)

(51) International patent classification?: A24F 47/00 A1

(11) International publication number: WO 00/28843

(43) International publication date: 25 May 2000

(21) International file number: PCT/EP99/08428

(22) International filing date: 8 November 1999

(30) Priority data:

198 54 005.1 12 November 1998 DE

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(81) Designated treaty countries: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH,
CN, CR, CU, CZ, DE, DK, DM, 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, MD, MG, MK, MN, MW, MX, NO, NZ,
PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA,
ZW, ARIPO Patent (GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM,
AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR,
GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW,
ML, MR, NE, SN, TD, TG).

Published:

with international search report

(54) Title: SYSTEM FOR SUPPLYING AN INHALABLE AEROSOL

(57) Abstract [see original]

System for supplying an inhalable aerosol

The invention concerns a system for supplying an inhalable aerosol as well as the components of such a system. This system is suitable in particular as a smoking article for supplying smoke aerosol to smokers.

When conventional cigarettes are smoked, most of the tobacco is burned not during the puffing, but in the intermissions. This leads to the formation of so-called second-hand smoke, which is often felt to be a nuisance by nonsmokers.

To overcome this problem, many new smoking articles have been proposed in which no tobacco is burned during intermissions between puffs. A common principle of such developments is that it is not the heat of combustion of the tobacco, but rather other energy sources are used to release the smoke aerosol. In this way, not only is the formation of secondhand smoke largely prevented, but also thanks to a changed temperature control during the puffs a preferred release of aromatic substances can also be accomplished and the formation of irritating or unwanted by-products reduced. Often the proposed smoking articles for formation of an aerosol make use not of tobacco, but substitute materials such as special homogenized sheet tobaccos or substrates coated with aromatic substances.

Thus, there is known a cigarette-like smoking article in which the thermal energy of a glowing carbon element is transmitted to an aluminum capsule arranged inside the cigarette, containing an aerosol-forming material.

In a modification of this smoking article, the aerosol-forming material used is a special homogenized sheet tobacco coated with large amounts of glycerin.

What is common to both of the aforementioned smoking articles is that the combustion gases of the heating element are inhaled along with the smoke aerosol, which leads to an increased uptake of carbon monoxide by the smoker. The spatial separation of energy source and aerosol former results in a lack of flavor during the first puffs on account of the difficult heat transfer. Furthermore, the entire smoking article, which unlike conventional cigarettes retains its length, must be disposed of after being smoked. This leads to a substantial accrual of complex residual materials and associated disposal problems.

Another known smoking article works by a different principle. Here, a cigarette-shaped article with filter and tobacco component at the tobacco end is inserted into an electronically controlled smoking device. In the smoking device, thanks to electrical heating elements, the tobacco-containing portion is heated at radially successive places with the puffs. This principle requires a complicated design of the smoking device, which has to be outfitted with several heating elements and a complicated electronic control unit. The manipulating of such a device is cumbersome on account of its size and shape and differs considerably from that of a conventional cigarette.

The problem which is solved by the present invention is to create a system for supplying of an inhalable aerosol, which has a simple basic layout and in particular can serve as a smoking article offering a similar taste experience to traditional cigarettes, yet whose use does not generate any secondhand smoke during the puffs.

This problem is solved by a system with the features of claim 1, having an inhalation device with the features of claim 33 and a substrate portion with the features of claim 35 and can have a mouthpiece with the features of claim 39. Advantageous configurations of the invention appear in the dependent claims.

The system according to the invention for supplying an inhalable aerosol is especially suited to smoking articles whose mode of operation is based on the heating of an aerosol-forming material during puffs. A preferably cylindrical substrate portion, which has at least one heating resistor and contains aerosol-forming material inside a sheath, is smoked in a special, preferably cigar or cigarette-shaped inhalation device. The heating resistor is preferably the sheath of the substrate portion, which is electrically conductive for this purpose, at least for part of its length. The substrate portion is heated in the inhalation device during puffs by supplying electric energy to the conductive sheath, so that aerosol is formed, which can be taken up by the smoker by drawing air through the air inlet opening of the sheath and across the aerosol outlet opening of the sheath. Thanks to the use of the smoking article, the formation of secondhand smoke during the pauses between puffs is prevented.

The basic principle of the invention thus relies on the closest possible physical arrangement of heat source and aerosol former.

This is accomplished in that the substrate portion itself has the heating resistor (or also several heating resistors), which is preferably configured as a conductive sheath of the substrate portion and is heated by applying a voltage across the contacts in the inhalation device.

As compared to the aforementioned known smoking articles, the system according to the invention has the advantage that despite a simple design no combustion gases are inhaled and the residues remaining after use can be disposed of in an environmentally compatible manner.

The invention shall be explained below with the help of sample embodiments. The drawings show

Fig. 1a, a perspective view of a substrate portion according to the invention,

Fig. 1b, a longitudinal section through the substrate portion of Fig. 1a,

Fig. 1c, a transverse section through the substrate portion of Fig. 1a,

Fig. 2a, a longitudinal section through another sample embodiment of a substrate portion according to the invention, having an integrated mouthpiece,

Fig. 2b, a perspective view of a sample embodiment of a substrate portion, in which a number of zones of electrical conductivity are provided spaced in the circumferential direction.

Fig. 2c, a perspective view of a sample embodiment of a substrate portion, in which a number of axially spaced zones of electrical conductivity are provided in the circumferential direction,

Fig. 3, a schematic longitudinal section through an inhalation device according to the invention, in which the substrate portion per Fig. 2a is used and which has a separate housing for control components and power supply,

Fig. 4a, a schematic longitudinal section through another sample embodiment of an inhalation device according to the invention, which is designed for the use of a separate mouthpiece and which has a separate housing for control components and power supply, with installed substrate portion and installed mouthpiece,

Fig. 4b, an illustration of the use of the system according to Fig. 4a by a smoker, and

Fig. 5, a schematic longitudinal section through another sample embodiment of an inhalation device according to the invention, which is designed for the use of a separate mouthpiece and in which the power supply is located in the housing, with installed substrate portion and installed mouthpiece.

A preferred sample embodiment of a substrate portion 1 is represented in figures 1a to 1c. The substrate portion 1 in the sample embodiment has a cylindrical shape, as can be seen in Fig. 1a to 1c. It contains an aerosol-forming material 2, which is surrounded by a radially arranged (i.e., on the cylindrical envelope) electrically conductive sheath 3.

The aerosol-forming material 2 can consist, for example, of cut lamina tobacco, cut tobacco stems, reconstituted tobacco, or a substrate material coated with aromatic substances. The use of cut lamina and stem can also be done in expanded form, such as is obtained for example by the use of the method described in the patents DE 29 03 300, DE 31 19 330 and DE 34 14 625. As substrate materials for the aromatic substances, one can use both organic materials such as paper and inorganic ones, such as silica gel. Any given mixtures of the mentioned components can also be used.

In the preferred sample embodiment, the material 2 contains a fraction of around 3% to 30% of a volatile polyol, such as glycerin or propylene glycol, in order to intensify the aerosol formation. Another way of intensifying the aerosol formation is the use of aerosol-forming material with a moisture content above the equilibrium moisture content. Thus, e.g., one can use tobacco whose equilibrium moisture content is around 10% to 12%, with a moisture content of 20%. In this case, a suitable packaging will ensure that no moisture loss occurs prior to use.

The electrically conductive sheath 3 can consist of paper provided with conductive additives (such as metals or graphite/carbon) or homogenized sheet tobacco or a plastic film made conductive likewise by additives. A multilayered sheath can also be used, while the inner layer can consist of paper or homogenized sheet tobacco and the outer layer of one of the mentioned conductive materials.

It is likewise possible to form the sheath first from a nonconductive material and then to put in place a conductive film before or after ensheathing the aerosol-forming material, e.g., by vapor deposition or spraying.

The production of substrate portions 1 can occur in simple manner on a traditional continuous cigarette making machine: at first, an endless strand of tobacco or substitute material is formed in a format section; this is surrounded by the conductive sheath material, supplied in the direction of manufacture from a reel, and glued along a seam. After this, the product is cut to length in the desired dimensions. A further option of manufacture is the extrusion of a suitable aerosol-forming material through a circular nozzle with subsequent ensheathing and cutting of the extruded product to length.

Preferably, the diameter of a substrate portion 1 is in the range of 5 mm to 12 mm and the length in the range of 10 mm to 100 mm. Especially preferable are diameters of 5 mm to 10 mm and lengths of 15 mm to 60 mm.

In one preferred sample embodiment, the substrate portion 1, as shown in Fig. 2a, is connected by a common sheath 11 to a mouthpiece 10. The manufacturing of such a connection is familiar to the person skilled in the manufacture of filter cigarettes. The substrate portion 1 can additionally have a higher electrical conductivity in zones 12 as compared to the rest of the sheath, such as can be accomplished e.g. by winding it with metal foil in the zones 12, in order to improve the electrical contact with the contacts in an inhalation device (see below).

Whereas in the sample embodiment of the substrate portion per Fig. 2a the substrate portion is designed as a single cohesive heating resistor, other sample embodiments of the substrate portion call for a segmented or sectionwise distribution of the electric conductivity of the sheath. This can be done as represented in Figure 2b or as in Fig. 2c, for example.

The sheath of the substrate portion per Figure 2b has a number of annular zones 13 with relatively high electric conductivity, every two neighboring zones 13 being separated by an insulating zone. Each of the zones 13 forms a separate heating resistor, which can be individually provided with power across appropriate contacts in the inhalation device on an inhalation device adapted to the substrate portion. The position of such contacts is indicated in Fig. 2b by arrows as well as the polarities "+" and "-". In one variant of this sample embodiment, the individual zones 13 do not run along the entire periphery of the substrate portion, but instead have each time an insulating interruption. In another variant, the zones 13 are merged in electrically conducting manner in a zone extending along the substrate portion, for example, one running along the contact sites "-" (or the "+" contact sites) per Fig. 2b, so that only one contact need be present in the inhalation device for this pole, as a kind of ground connection.

In the sample embodiment of a substrate portion shown in Fig. 2c, the sheath of the substrate portion has a number of electrically conductive zones 15 insulated against each other and staggered in the circumferential direction. The zones 15 serving as separate heating resistors extend over the length of the substrate portion. In an end region of the substrate portion, they are merged in electrically conducting manner by a ring-shaped contact zone 14, where the electrical resistance of the contact zone 14 is preferably less than that of a zone 15.

At this end, in an inhalation device adapted to the substrate portion, only one "-" contact is required, while at the other end a number of contacts are provided, being shown by arrows in Fig. 2c and designated with "+". The "+" contacts enable a separate actuating of the zones 15. In order to ensure the required orientation of the substrate portion in the inhalation device in a defined angular position, a positioning feature is provided in the sample embodiment in the form of a notch 16, which engages with a corresponding guide shoulder on the inhalation device when the substrate portion is introduced into the inhalation device.

A sample embodiment of an inhalation device (called hereinafter a smoking device) shall be described below with the aid of Fig. 3. This smoking device is designed for use with a substrate portion per Fig. 2a.

As shown by Fig. 3, two contacts (electrodes) 21 and 22 are situated in a housing 20, by which the contact with the conductive sheath of a substrate portion contained in the smoking device is produced. The cavity inside the housing 20 and the contacts 21 and 22 form a receiving mechanism to hold the substrate portion. Through an opening 24, air can be drawn through the substrate portion. By an electrical connection 25, the contact 21 is connected directly to a power supply unit 30 arranged in a separate housing. The connection to the contact 22 runs across a switch 23, by which the circuit can be closed. The power supply unit 30 contains a battery or a storage battery 31 and also optionally a control unit 32. In the case of a storage battery, this can be charged across plug contacts 33.

The smoking device is used as follows: the smoking device is joined to the power supply unit 30 by a cord (connection 25) (also see Fig. 4b). The substrate portion 1 provided with the mouthpiece 10 is shoved into a conically configured opening at one end face of the housing 20, until it stops against the contact 21, see Figure 3. The smoking device is now placed in one's mouth and the switch 23 is operated. By closing the circuit, the substrate portion is heated by the current flowing across the contacts 21 and 22 through the sheath acting as heating resistor, and the resulting aerosol can be removed through the mouthpiece 10. Disconnection is done by releasing the switch 23 or by the control unit 32. In this way, several puffs can be taken. After use, the substrate portion 1 with the mouthpiece 10 is removed from the smoking device and disposed of. From time to time a battery replacement or charging of the storage battery 31 in the power supply unit 30 is necessary.

Figure 4a shows another sample embodiment of the system, differing from the preceding one in that mouthpiece 10' and substrate portion 1' are not joined together. The mouthpiece 10' is inserted into a base 42, and after the substrate portion 1' is inserted into a smoking device having a housing 40, this is screwed together with the housing 40. The base 42 serves at the same time as a contact.

The function and use of this smoking device and the other components of the system otherwise correspond to the previous sample embodiment. In Figure 4a the second contact is designated as 41, the switch as 43, the opening for the air intake as 44, the connection cord as 45, the power supply unit as 30', the battery or the storage battery as 31', the control unit as 32' and the plug contacts as 33'.

The use of the smoking article is shown in Figure 4b. The smoking device with mouthpiece and substrate portion can be handled like a traditional cigarette; the power supply unit is preferably carried in a breast pocket, a belt holder, or the like. The two parts are joined together by a highly flexible cord (connection cord 45) of sufficient length.

A single-piece sample embodiment of the smoking device with cigarette shape is shown in Figure 5. A housing 50 has at the front end a screw-off cap 53, by which it is possible to replace a battery or a storage battery 51. A swiveling flap 52, which is also drawn in the swiveled open state, serves to insert a substrate portion 1". When the flap 52 is opened, at the same time a rod, not shown, moves a receiving section 55 backward against the force of a helical spring 56 in order to facilitate the inserting of the substrate portion 1". The force of the helical spring 56 acting when the flap 52 is closed produces a fixation of the substrate portion 1" between a contact 57 and the receiving section 55, which serves at the same time as a mating contact. By closing a switch 60, current flows between the contacts 55, 57 across the conductive sheath of the substrate portion 1", so that this becomes heated. The smoke aerosol can be removed by puffing on a mouthpiece 10" inserted into the receiving section 55, being configured as a separate component and not connected permanently to the substrate portion 1" in this sample embodiment. Air flows through a channel 54 and enters the substrate portion 1" at its front end.

In a smoking device which is designed for use of a substrate portion per Fig. 2b or per Fig. 2c, there are contacts coordinated in pairs with a zone 13 or 15 serving as a heating resistor. If, as described above, a common pole is provided in electrically conducting manner, only one contact needs to be present for this. By a sequential power supply each time to a zone 13 or 15, a new piece of the substrate portion can be heated each time, which ensures a more uniform aerosol output through the puffs. This produces a largely constant flavor output per puff. The control can occur through a puff detector, for example, which responds to the change in pressure when the user draws in air and supplies power to one of the zones 13 or 15 through a switching mechanism. During the next puff, the switching mechanism responds once more, but this time an electronic circuit ensures that the heating current is applied across the coordinated contacts to a different, not yet used zone 13 or 15, and so on.

For the design of the mouthpiece 10, 10' or 10", basically all principles familiar to the specialist in the cigarette industry can be used. In the most simple case, the mouthpiece consists of a hollow roll of paper or carton. Preferable, however, is a design as a filter mouthpiece. In this case, a filter material such as cellulose acetate, polypropylene or paper is provided with a single or multiple layered sheath. One can also use a design corresponding to the known multiple filters, in which several segments with different properties are arranged in succession in the axial direction and joined by an outer sheath. In this case, one or more segments can be provided with axial boreholes. In all mentioned designs, furthermore, it is possible to use a zone-perforated sheath or a subsequent perforation of the sheath, for example, by laser beam. In this way, the smoke can be diluted by intake of outside air during the puffs.

Further variants of the system or its components will emerge directly from the claims.

In what follows, a further example is given for a substrate portion with mouthpiece and its use in the system.

Example

An American-Blend tobacco mixture with content

30% Burley tobacco
40% expanded Virginia tobacco
20% nonexpanded Virginia tobacco, and
10% Turkish tobacco

was conditioned and sprayed with 12 wt.-% of an aqueous casing with a glycerin content of 80 wt.-%. Next, the tobacco was cut with a cut width of 0.8 mm and dried to a moisture content of 12%. 180 kg of this cut tobacco was blended with 20 kg of expanded stem cut.

This blend was used to produce an endless strand with a diameter of 6 mm and a **packing** density of 200 mg/ml on a continuous cigarette making machine. As the sheath material, air-impermeable paper made conductive by addition of graphite was used. The endless strand was cut into individual portions of 40 mm length, and these were connected to an acetate filter plug in familiar fashion by a mouthpiece joining paper.

The substrate portion so obtained was smoked in a smoking device per Figure 3, without producing any visible amounts of secondhand smoke. The flavor was judged by taste testers as being uniform and equivalent to a that of traditional cigarettes.

Patent claims

1. System for supplying an inhalable aerosol, with
 - a substrate portion (1; 1'; 1'') , having at least one heating resistor (3; 13; 15) and containing aerosol-forming material (2) inside a sheath (3), wherein the sheath (3) has an air inlet opening and an aerosol outlet opening, and
 - an inhalation device, having a housing (20; 40; 50), a receiving section to hold the substrate portion (1; 1'; 1'') and contacts (21, 22; 41, 42; 55, 57) in contact or able to be brought into contact with a voltage source (31; 31'; 51) for supply of electric power to the at least one heating resistor (3; 13; 15) of the substrate portion (1; 1'; 1'').
2. System according to claim 1, characterized by a mouthpiece (10; 10'; 10''), which can be connected separately (10'; 10'') to the inhalation device or which is connected to the substrate portion (1) and in the operating state stands in communication with the aerosol outlet opening of the substrate portion (1; 1'; 1'').
3. System according to claim 1 or 2, characterized in that the sheath (3) of the substrate portion (1; 1'; 1'') is electrically conductive at least in sections and is designed as at least one heating resistor (3; 13; 15).
4. System according to claim 3, characterized in that the sheath (3) of the substrate portion is designed as a single cohesive heating resistor.
5. System according to claim 3, characterized in that the substrate portion has a longitudinal axis and the sheath of the substrate portion has a number of axially staggered and mutually insulated heating resistors (13), which are merged in electrically conducting manner preferably in a zone extending along the substrate portion.
6. System according to claim 3, characterized in that the substrate portion has a longitudinal axis and the sheath of the substrate portion has a number of heating resistors (15) staggered in the circumferential direction and insulated from each other, which extend preferably along the length of the substrate portion and which are preferably merged in electrically conducting manner in an end region (14) of the substrate portion, while the substrate portion preferably has a positioning feature (16) adapted to the inhalation device for inserting into the inhalation device in a defined angular position.
7. System according to one of claims 3 to 6, characterized in that the sheath (3) of the substrate portion (1; 1'; 1'') has metal foil, metal-coated or metal-containing paper, carbon containing paper, graphite-containing paper, an electrically conductive film, plastic film provided with conductive additives and/or homogenized sheet tobacco provided with conductive additives.

8. System according to one of claims 3 to 7, characterized in that the sheath (3) of the substrate portion (1; 1'; 1'') has several layers of sheath materials, wherein the outer layer has electrically conductive material and the inner layer consists preferably of paper or homogenized sheet tobacco.
9. System according to one of claims 3 to 8, characterized in that the sheath (3) of the substrate portion (1; 1'; 1'') in the region between the contact sites to the two contacts (21, 22; 41, 42; 55, 57) of the inhalation device coordinated with a heating resistor (3; 13; 15) has an electrical resistance of 0.1 Ohm to 1000 Ohm.
10. System according to one of claims 3 to 9, characterized in that the zones (12) of the sheath (3) of the substrate portion (1) which can be brought into contact with the contacts (21, 22; 41, 42; 55, 57) of the inhalation device have an increased electrical conductivity as compared to the other material of the sheath (3), preferably by means of a metal coating.
11. System according to one of claims 1 to 10, characterized in that the substrate portion (1; 1'; 1'') has a cylindrical shape with a length of 10 mm to 100 mm, preferably 15 mm to 60 mm, and a diameter of 4 mm to 12 mm, preferably 5 mm to 10 mm.
12. System according to one of claims 3 to 10 and according to claim 11, characterized in that the at least sectionwise electrically conductive sheath (3) of the substrate portion (1; 1'; 1'') is arranged as a cylindrical envelope and the end faces of the cylinder are designed as an air inlet opening and an aerosol outlet opening.
13. System according to one of claims 1 to 12, characterized in that the aerosol-forming material (2) of the substrate portion (1; 1'; 1'') has cut tobacco, cut tobacco stems, homogenized sheet tobacco cut and/or an extruded tobacco material.
14. System according to one of claims 1 to 13, characterized in that the aerosol-forming material (2) of the substrate portion (1; 1'; 1'') has a substrate material coated with aromatic substances.
15. System according to one of claims 1 to 14, characterized in that the aerosol-forming material (2) of the substrate portion (1; 1'; 1'') contains an evaporable polyol, preferably glycerin or propylene glycol, in a fraction of 5 wt.-% to 50 wt.-%, preferably 10 wt.-% to 30 wt.-%.

16. System according to one of claims 1 to 15, characterized in that the inhalation device has at least one switch (23; 43; 60) for the at least one heating resistor (3; 13; 15).
17. System according to one of claims 1 to 16, characterized in that the inhalation device has a puff detector, which together with a switching mechanism is designed to switch the circuit leading through a heating resistor (3; 13; 15) of the substrate portion (1; 1' ; 1'') in dependence on the flow rate directed toward the air inlet opening of the substrate portion (1; 1'; 1'').
18. System according to one of claims 1 to 17, characterized in that the inhalation device has a circuit, preferably an electronic circuit (32; 32'), for controlling the power put out by the at least one heating resistor (3; 13; 15) of the substrate portion (1; 1'; 1'').
19. System according to claim 18 in conjunction with claim 4, characterized in that the circuit (32; 32') of the inhalation device is designed to control the voltage or the current for the heating resistor (3) of the substrate portion (1; 1'; 1'') so that the heating power upon the first puff is set to a higher value than for the other puffs, and also to interrupt the power supply after a defined puffing time in order to avoid an overheating.
20. System according to claim 18 in conjunction with claim 5 or 6, characterized in that the circuit (32; 32') of the inhalation device is designed to sequentially activate the contacts coordinated with the individual heating resistors (13; 15) to sequentially turn on the individual heating resistors (13; 15).
21. System according to one of claims 18 to 20, characterized in that the circuit is accommodated inside the housing of the inhalation device.
22. System according to one of claims 18 to 20, characterized in that the circuit (32; 32') is accommodated in a separate housing (30; 30'), which is connected or can be connected to the housing (20; 40) of the inhalation device via a cord (25; 45).
23. System according to one of claims 1 to 22, characterized in that a battery or a storage battery (31; 31'; 51) is provided for the power supply to the contacts (21, 22; 41, 42; 55, 57) of the inhalation device, which is accommodated or can be accommodated in the housing (50) of the inhalation device or in a separate housing (30; 30').

24. System according to one of claims 1 to 23, characterized in that the housing (50) of the inhalation device has the shape of a cigar.
25. System according to one of claims 1 to 23, characterized in that the housing (20; 40) of the inhalation device has the shape of a cigarette.
26. System according to one of claims 2 to 25 in conjunction with claim 2, characterized in that the mouthpiece (10; 10'; 10'') has a length of 10 mm to 50 mm and a diameter of 4 mm to 12 mm.
27. System according to one of claims 2 to 26 in conjunction with claim 2, characterized in that the mouthpiece (10; 10'; 10'') has a hollow sleeve of paper or carton.
28. System according to one of claims 2 to 26 in conjunction with claim 2, characterized in that the mouthpiece (10; 10'; 10'') is configured as a filter mouthpiece, where the filter material has preferably cellulose acetate, paper, myria and/or polypropylene with a single or multiple layer paper sheath.
29. System according to claim 28, characterized in that the mouthpiece (10; 10'; 10'') has a filter plug of several partial elements arranged in succession in the axial direction, one or more of which preferably have axial boreholes.
30. System according to one of claims 2 to 29 in conjunction with claim 2, characterized in that the mouthpiece (10; 10'; 10'') has one or more perforation zones.
31. System according to one of claims 2 to 30 in conjunction with claim 2, characterized in that the substrate portion (1) and the mouthpiece (10) have a similar diameter and are joined together.
32. System according to claim 31, characterized in that the substrate portion (1) and mouthpiece (10) are connected by a common wrapping (11) with a mouthpiece joining paper.
33. Inhalation device, with a housing (20; 40; 50), with a receiving section for holding a substrate portion (1; 1'; 1'') having an aerosol-forming material, and with contacts (21, 22; 41, 42; 55, 57) connected to or able to be connected to a voltage source (31; 31'; 51) for the supplying of electric power to at least one heating resistor of the substrate portion (1; 1'; 1'').

34. Inhalation device according to claim 33, characterized by features of the inhalation device from one of claims 16 to 25.
35. Substrate portion, which is designed for use with an inhalation device according to claim 33 or 34 and having at least one heating resistor (3; 13; 15) and containing aerosol-forming material (2) inside a sheath (3), wherein the sheath (3) has an air inlet opening and an aerosol outlet opening.
36. Substrate portion according to claim 35, characterized by features of the substrate portion (1; 1' ; 1'') from one of claims 3 to 15.
37. Substrate portion according to claim 35 or 36, characterized by a mouthpiece (10), which is connected to the substrate portion (1) and stands in communication with the aerosol outlet opening of the substrate portion (1).
38. Substrate portion according to claim 37, characterized, in that the mouthpiece (10; 10'; 10'') has features from one of claims 26 to 32.
39. Mouthpiece, which is designed for use with an inhalation device according to claim 33 or 34, can be connected separately (10'; 10'') to the inhalation device and in the operating state stands in communication with the aerosol outlet opening of the substrate portion (1'; 1'').
40. Mouthpiece according to claim 39, characterized by features of the mouthpiece (10'; 10'') from one of claims 26 to 30.



Fig. 1a

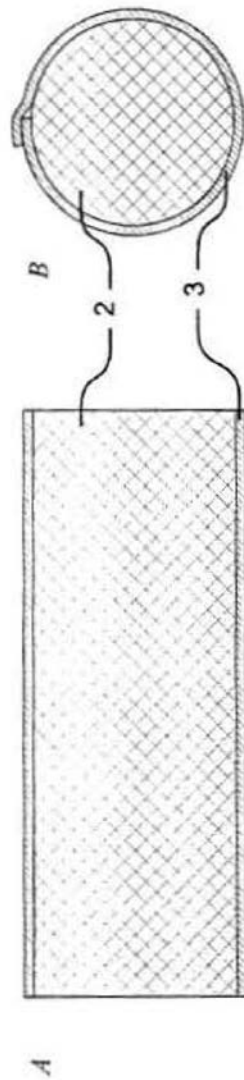
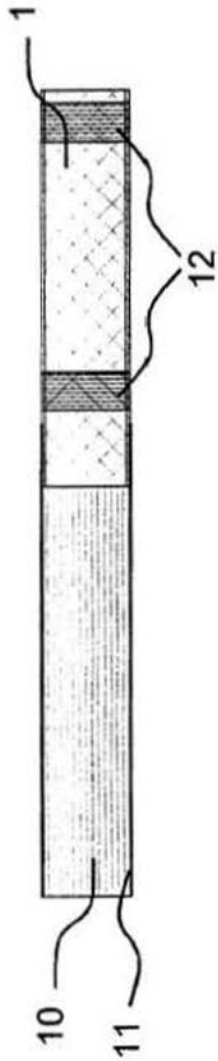


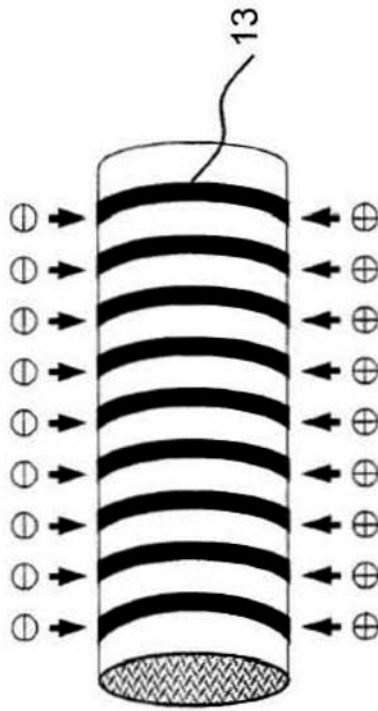
Fig. 1b

Fig. 1c

Figures. 2a



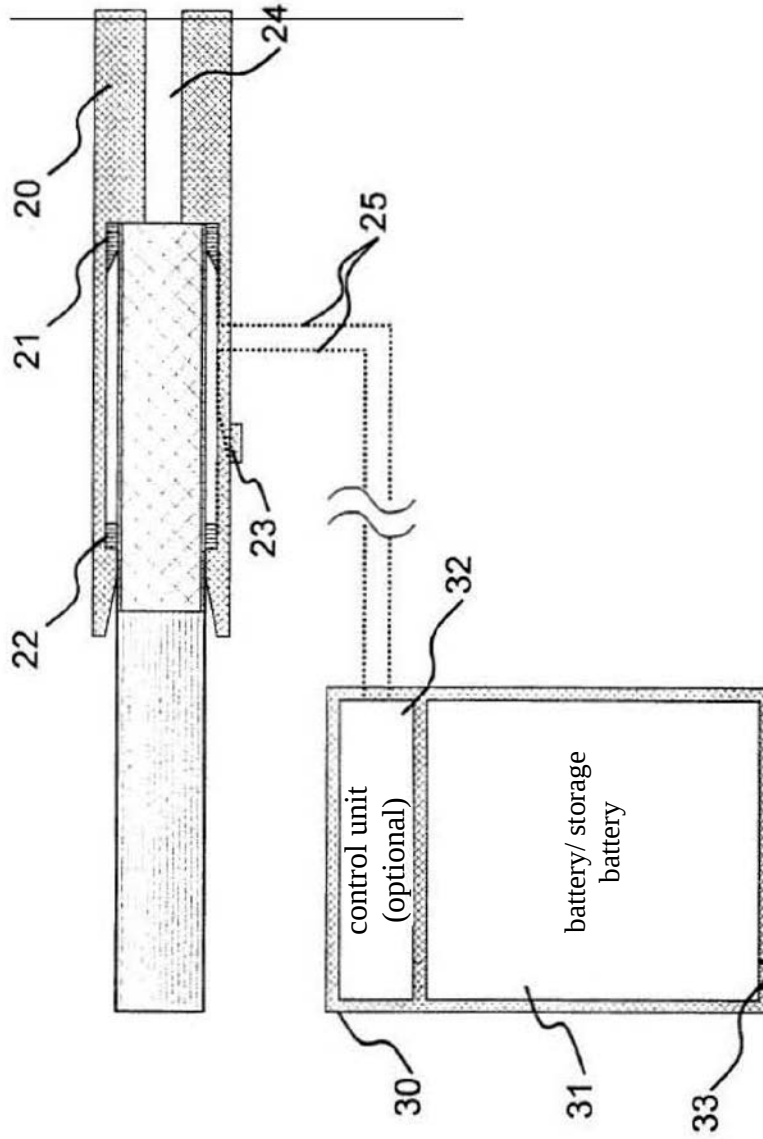
Figures. 2b



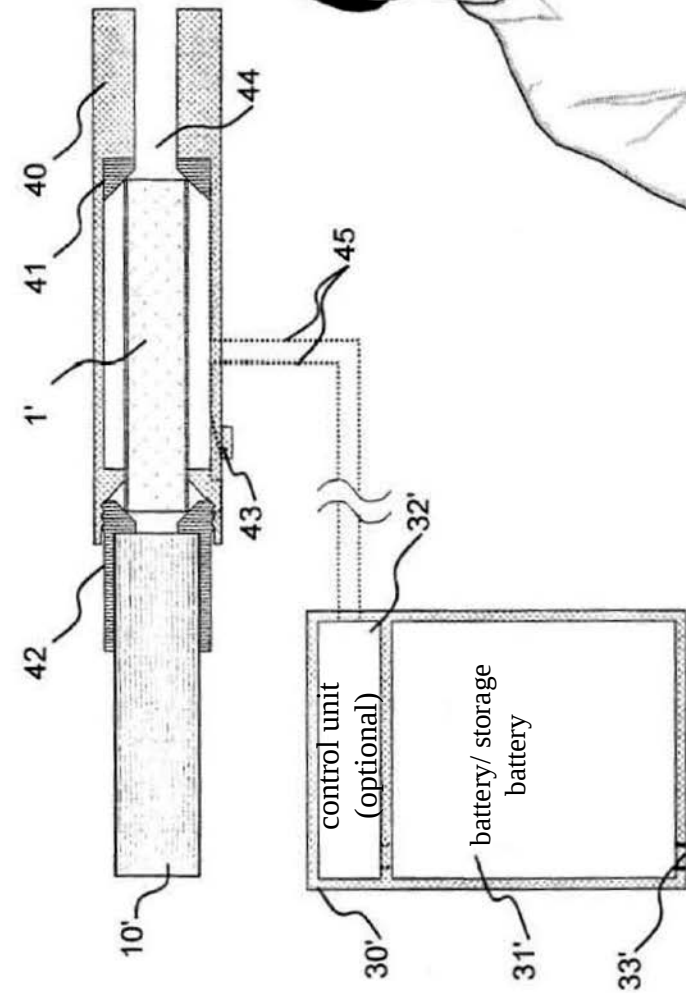
Figures. 2c



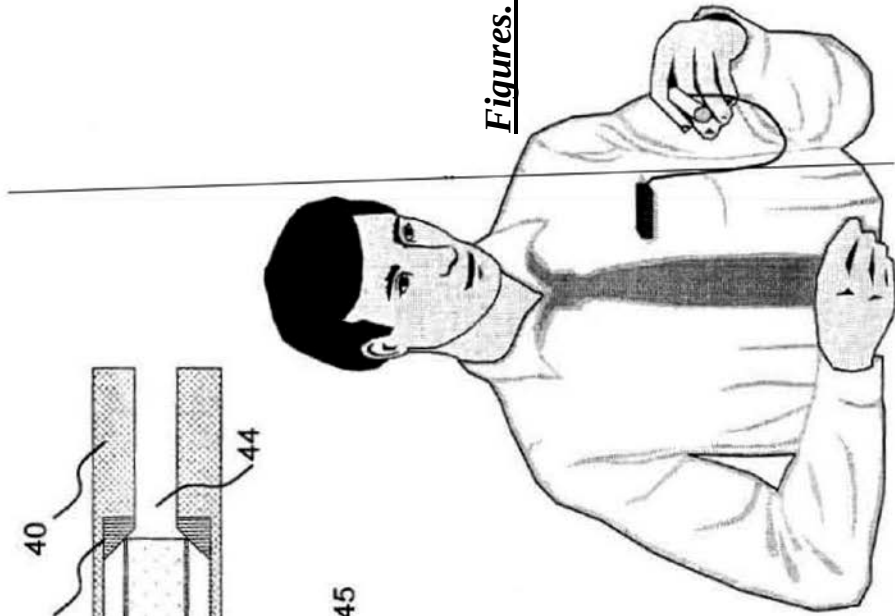
Figures. 3



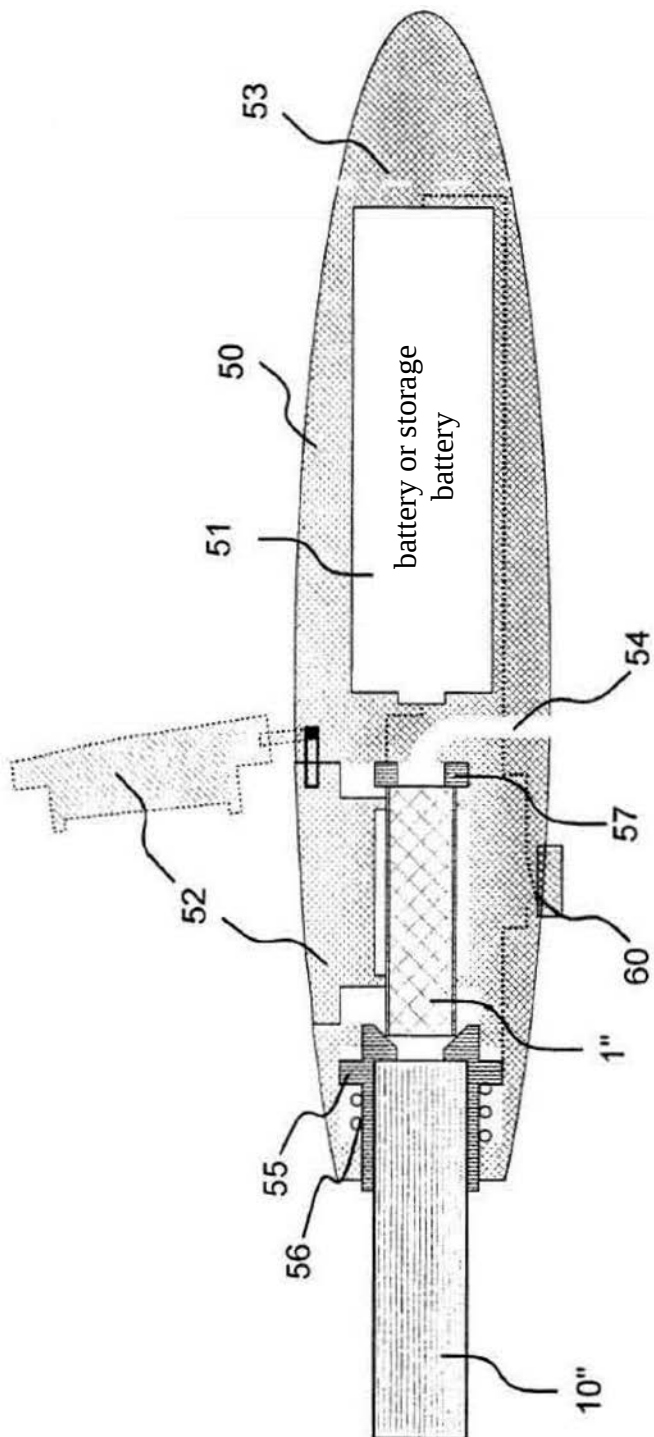
Figures. 4a



Figures. 4b



Figures. 5



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