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E-cigarette

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E-cigarette comprising a housing having a liquid section for holding a liquid and a battery section for holding a battery, which liquid section and battery section are configured to be coupled to each other, and a wick to take up the liquid, a heating member for heating the wick, wherein the liquid section comprises a liquid reservoir provided with a liquid outlet to supply liquid to the wick and an air duct to create an air flow along the wick and to an air outlet.

Title: E-cigarette

5 FIELD OF THE INVENTION

The invention relates to an electronic cigarette for providing a vapour. The vapour can be inhaled by a person.

BACKGROUND OF THE INVENTION

10 The known electronic cigarette comprises a housing having a liquid section and a battery section, and a wick and heating member located in the housing. The electrical wires are attached to the heating member to provide electrical power from the battery. A disadvantage of the known electronic cigarette is that it is difficult to produce, especially to produce it mechanically.

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SUMMARY OF THE INVENTION

The invention has the objective to provide an improved, or at least alternative, e-cigarette. According to one aspect according to the invention, the object is to provide an e-cigarette which can be produced in a more efficient manner. According to a further aspect
20 according to the invention, the object is to provide an e-cigarette which is can be produced mechanically.

The e-cigarette according the invention comprises a housing having a liquid section for holding a liquid and a battery section for holding a battery, which liquid section and battery section are configured to be coupled to each other, a wick to take up the liquid, and a heating
25 member for heating the wick, wherein the liquid section comprises a liquid reservoir provided with a liquid outlet to supply liquid to the wick and an air duct to create an air flow along the wick and to an air outlet, the heating member and the wick are combined to form a combined construction having an outer surface which is at least partly electrically conductive, and the e-
cigarette comprises a first electrical contact member being electrically connected to an anode
30 of the battery and a second electrical contact member being electrically connected to a cathode of the battery, which first and second electrical contact members are in contact with conductive parts of the outer surface of the combined construction without being attached to them.

Since the wick and the heating member form a combined construction, they can be
35 supplied during the production process in a single processing step. In the known e-cigarette, the wick and the heating member are each supplied in a separate processing step. This

allows that the e-cigarette according to the invention can be produced in a more efficient manner. It especially allows that the production process can be performed mechanically.

5 The e-cigarette further allows that the battery is electrically connected to the combined construction of the wick and heating member without being attached to it (via for example welded electrical wires). The process of electrically attaching elements is difficult to perform, especially to perform it mechanically. The fact that in the e-cigarette according to the invention the combined construction is electrically connected to the first and second electrical contact members without being attached to them, allows that the e-cigarette can be produced in a more simple manner. Due to this, the e-cigarette can be produced in a cost
10 efficient manner by machines instead of by the hands of a person.

In an embodiment of the e-cigarette, the entire combined construction extends along a straight line or a substantially straight line.

In an embodiment of the e-cigarette, the combined construction has an elongate form extending along its longitudinal axis.

15 In an embodiment of the e-cigarette, the combined construction has such a rigidity that it maintains its form when subjected to gravity.

In an embodiment of the e-cigarette, the combined construction has such a rigidity that it maintains its form when handled mechanically, such as during mechanical pick and place operations.

20 In an embodiment of the e-cigarette, the combined construction has a cross section perpendicular to the longitudinal axis, which cross section is constant along the longitudinal axis. The cross section can have the form of a circle, a square, a rectangle, or a polygon.

In an embodiment of the e-cigarette, the first and second electrical contact members are located at a distance from each other along the longitudinal axis of the combined
25 construction.

In an embodiment of the e-cigarette, the combined construction is located between a first support member and an opposite second support member to hold the combined construction in a fixed position.

30 In an embodiment of the e-cigarette, the first and second electrical contact members are provided on the first support member. The second support member may comprise a first electrically conductive member located opposite to the first electrical contact member and a second electrically conductive member located opposite to the second electrical contact member.

35 In an embodiment of the e-cigarette, the first and second electrical contact members are provided on the second support member. The first support member may comprise a first electrically conductive member located opposite to the first electrical contact member and a

second electrically conductive member located opposite to the second electrical contact member.

In an embodiment of the e-cigarette, the combined construction is in contact with the first and second support member without being attached to them.

5 In an embodiment of the e-cigarette, the combined construction is free from any attached contact with the e-cigarette. The combined construction may only have contact with the liquid section without being attached to it, or the battery section without being attached to it, or the liquid section and the battery section without being attached to them.

10 In an embodiment of the e-cigarette, the wick of the combined construction is formed by a ceramic material. The ceramic material may have a porous structure.

In an embodiment of the e-cigarette, the wick of the combined construction is formed by a fibrous material. The fibrous material may be a fibre rope.

In an embodiment of the e-cigarette, the heating member of the combined construction is formed by an electrically conductive wire.

15 In an embodiment of the e-cigarette, the electrically conductive wire extends along the entire length of the wick.

In an embodiment of the e-cigarette, the electrically conductive wire is wound in a helical form around the wick.

20 In an embodiment of the e-cigarette, the heating member is formed by an electrically conductive additive provided in the ceramic material.

In an embodiment of the e-cigarette, the combined construction is located in the liquid section.

25 In an embodiment of the e-cigarette, the liquid section comprises a first liquid part and a second liquid part, the first liquid part is provided with the liquid reservoir and the air outlet, the liquid outlet is located adjacent to the combined construction, the air duct extends from the combined construction to the air outlet, the first liquid part comprises a first coupling member and the second liquid part comprises a second coupling member which is configured to cooperate with the first coupling member to couple the second liquid part to the first liquid part such that the second liquid part is located in a coupled position, the first and second
30 contact members are provided on the second liquid part.

In an embodiment of the e-cigarette, the second liquid part comprises a third electrical contact member being electrically connected to the first electrical contact member and a fourth electrical contact member being electrically connected to the second electrical contact member, which third and fourth electrical contact member are configured to become
35 electrically connected with the battery when the battery section is coupled to the liquid section.

In an embodiment of the e-cigarette, the first liquid part is provided with the first support member and the second liquid part is provided with the second support member.

In an embodiment of the e-cigarette, the liquid reservoir is provided with a further liquid outlet located adjacent to the combined construction, the combined construction
5 comprises a first construction end, a second construction end and an intermediate construction part which is located between the first construction end and the second construction end, and the first construction end is located at the liquid outlet, the second construction end is located at the further liquid outlet and the air duct is located at the intermediate construction part.

10 In an embodiment of the e-cigarette, the battery section comprises a fifth electrical contact member and a sixth electrical contact member which are in contact with the anode and the cathode of the battery, respectively, and the liquid section and the battery section are configured to place the third electrical contact member and the fourth electrical contact member in contact with the fifth electrical contact member and the sixth electrical contact
15 member, respectively, when the liquid section is coupled to the battery section.

In an embodiment of the e-cigarette, the first liquid part is formed as a first single piece.

In an embodiment of the e-cigarette, the first liquid part is formed by injection moulding.

20 In an embodiment of the e-cigarette, the second liquid part is formed as a second single piece.

In an embodiment of the e-cigarette, the second liquid part is formed by injection moulding on electrically conductive material or by injection moulding in a first production step and electrically conductive material is deposited in a second production step.

25 In an embodiment of the e-cigarette, the combined construction is located in the battery section.

In an embodiment of the e-cigarette, the battery section comprises a first battery part and a second battery part, the first battery part is provided with the battery, the first battery part comprises a first coupling member and the second battery part comprises a second
30 coupling member which is configured to cooperate with the first coupling member to couple the second battery part to the first battery part such that the second battery part is located in a coupled position, the first and second contact members are provided on the first battery part.

In an embodiment of the e-cigarette, the first battery part is provided with the first
35 support member and the second battery part is provided with the second support member.

The invention further relates to a method of producing an e-cigarette, which method comprises the steps of providing the combined construction and positioning it on the liquid

section or the battery section, and placing first and second contact members in contact with the outer surface of the combined construction without attaching the first and second contact members to the combined construction.

In an embodiment, the method comprises the step of placing the combined
5 construction on the first support member, and placing the second support member in contact with the combined construction such that the combined construction is held in a fixed position.

In an embodiment, the method comprises the step of placing the combined
construction in the first liquid part such that the combined construction extends along the
10 liquid outlet and the air duct, and subsequently coupling the second liquid part to the first liquid part such that the second liquid part is located in the coupled position while the first and second electrical contact members contact electrically conductive parts at the outer surface of the combined construction.

In an embodiment, the method comprises the step of placing the combined
15 construction in the first battery part, and subsequently coupling the second battery part to the first battery part such that the second battery part is located in the coupled position while the first and second electrical contact members contact electrically conductive parts at the outer surface of the combined construction.

In an embodiment of the method, the placing of the combined construction and the
20 placing of the first and second contact members in contact with the combined construction is performed mechanically.

In an embodiment, the method comprises coupling the liquid section and the battery section to each other.

In an embodiment, the method comprises the steps of coupling the liquid section to
25 the battery section such that the third electrical contact member and the fourth electrical contact member of the liquid section are in contact with the fifth electrical contact member and the sixth electrical contact member of the battery section.

BRIEF DESCRIPTION OF THE DRAWINGS

30 Embodiments of the e-cigarette and the method to produce the e-cigarette will be described by way of example only, with reference to the accompanying schematic drawings in which corresponding reference symbols indicate corresponding parts, and in which:

Figure 1 schematically shows a view in perspective of a first embodiment of the e-cigarette according to the invention,

35 Figure 2 schematically shows a view in cross section along plane II of the e-cigarette of fig. 1,

Figure 3 schematically shows a view in cross section along plane III of the e-cigarette of fig. 1,

the Figures 4A and 4B schematically show a view in perspective of the e-cigarette of fig. 1,

5 Figure 5 schematically shows an enlarged view in perspective of the liquid section of the e-cigarette of fig. 1,

Figure 6 schematically shows a view in cross section along plane VI of the liquid section of fig. 5,

10 Figure 7 schematically shows a view in cross section along plane VII of the liquid section of fig. 5,

Figure 8 schematically shows an exploded view of the liquid section of fig. 5,

Figure 9 schematically shows a view in perspective of the first liquid part of the liquid section of fig. 5,

15 Figure 10 schematically shows a view in perspective of the second liquid part of the liquid section of fig. 5,

Figure 11 schematically shows a top view of a first embodiment of the combined construction of the liquid section of fig. 5,

Figure 12 schematically shows a top view of a second embodiment of the combined construction of the liquid section of fig. 5,

20 the Figure 13-16 schematically shows a first embodiment of the method of producing the e-cigarette,

Figure 17 schematically shows a view in cross section of a second embodiment of the e-cigarette according to the invention, wherein the cross sectional view is similar to the one shown in figure 2,

25 Figure 18 schematically shows a view in cross section of the second embodiment of the e-cigarette, wherein the cross sectional view is similar to the one shown in figure 3,

the Figures 19 and 20 schematically show a view in perspective of the second embodiment wherein the liquid section is separated from the battery section, and

Figure 21 schematically shows an exploded view of the second embodiment.

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DETAILED DESCRIPTION OF THE DRAWINGS

The figures 1-4 show a first embodiment of the e-cigarette 1 according to the invention. Figure 1 and 4 show a view in perspective of the e-cigarette 1 and the figures 2 and 3 show a view in cross section.

35 The e-cigarette 1 comprises a housing 2 having a liquid section 3 for holding a liquid and a battery section 4 for holding a battery 5. The liquid section 3 and the battery section 4 are configured to be coupled to each other via a first section coupling member 26 provided

on the liquid section 3 a second section coupling member 27 provided on the battery section 4. The wick 6 for taking up the liquid and the heating member 7 for heating the wick are combined to form a combined construction 12 having an outer surface 13 which is at least partly electrically conductive. This is further discussed in detail with respect to the figures 11 and 12.

The liquid section 3 comprises a liquid reservoir 8 provided with a liquid outlet 9A to supply liquid to the wick 6 and an air duct 10 to create an air flow along the wick 6 and to an air outlet 11. The e-cigarette 1 comprises a first electrical contact member 14 being electrically connected to an anode of the battery 5 and a second electrical contact member 15 being electrically connected to a cathode of the battery 5. The first and second electrical contact members 14, 15 are in contact with conductive parts 18A, 18B of the outer surface 13 of the combined construction 12 without being attached to them.

The e-cigarette 1 comprises an airflow sensor 28 which controls a switch 30 in order to close an electrical circuit 29 which connects the first and second electrical contact members 14, 15 to the anode and cathode of the battery 5 when an airflow is detected and to open the electrical circuit 29 when no airflow is detected. The airflow is indicated by arrows.

Since the wick 6 and the heating member 7 form a combined construction 12, they can be supplied during the production process in a single processing step. In the known e-cigarette, the wick and the heating member are each supplied in a separate processing step. This allows that the e-cigarette 1 according to the invention can be produced in a more efficient manner. It especially allows that the production process can be performed mechanically.

The e-cigarette 1 further allows that the battery 5 is electrically connected to the combined construction 12 of the wick 6 and heating member 7 without being attached to it (via for example welded electrical wires). The process of electrically attaching elements is difficult to perform, especially to perform it mechanically. The fact that in the e-cigarette 1 according to the invention the combined construction 12 is electrically connected to the first and second electrical contact members 14, 15 without being attached to them, allows that the e-cigarette 1 can be produced in a more simple manner. Due to this, the e-cigarette 1 can be produced in a cost efficient manner by machines instead of by the hands of a person.

The figure 5-7 shows enlarged views of the liquid section 3 of the e-cigarette 1 of fig. 1.

The entire combined construction 12 extends along a substantially straight line. The combined construction 12 has an elongate form extending along its longitudinal axis 20. The combined construction 12 has such a rigidity that it maintains its form when subjected to gravity. Each of these characteristics allows that the combined construction 12 can be mechanically handled.

In the known e-cigarette, the wick is in general very flexible and does not maintain its form when subjected to gravity or does not maintain its form when handled mechanically, such as during mechanical pick and place operations. It is therefore very difficult to mechanically handle the known wick. The known wick in general also extend in different
5 directions. The known wicks have a first part which extend inside the liquid reservoir and a second part which extends in a different direction along the heading member. Since the known wick extends in different directions, it is difficult to handle it mechanically, such as for mechanical pick and place operations.

The combined construction 12 is located between a first support member 21 and an
10 opposite second support member 22 to hold the combined construction 12 in a fixed position 23. This ensures that there is a continuous contact between the combined construction 12 and the first and second electrical contact members 14, 15.

The first and second electrical contact members 14, 15 are provided on the second support member 22. The first support member 21 comprises a first electrically conductive
15 member 47 located opposite to the first electrical contact member 14 and a second electrically conductive member 48 located opposite to the second electrical contact member 15. The first and second electrically conductive members 47, 48 enhance the performance of the e-cigarette 1.

The combined construction 12 is in contact with the first and second support member
20 21, 22 without being attached to them. The combined construction 12 is free from any attached contact with the e-cigarette 1. This allows that the e-cigarette 1 can be produced mechanically in an efficient manner.

The first and second electrical contact members 14, 15 are located at a distance D from each other along the longitudinal axis 20 of the combined construction 12 (see also
25 figure 10). This ensures that an electrical current can flow through the combined construction 12.

The combined construction 12 of the e-cigarette 1 is located in the liquid section 3. The liquid section 3 comprises a first liquid part 31 and a second liquid part 32. The first liquid part 31 is provided with the liquid reservoir 8 and the air outlet 11. The liquid outlet 9A is
30 located adjacent to the combined construction 12. The air duct 10 extends from the combined construction 12 to the air outlet 11.

The first liquid part 31 comprises a first coupling member 33 and the second liquid part 32 comprises a second coupling member 34 which is configured to cooperate with the first coupling member 33 to couple the second liquid part 32 to the first liquid part 31 such
35 that the second liquid 32 part is located in a coupled position 35. The first and second contact members 14, 15 are provided on the second liquid part 32.

The second liquid part 32 comprises a third electrical contact member 36 being electrically connected to the first electrical contact member 14 and a fourth electrical contact member 37 being electrically connected to the second electrical contact member 15, which third and fourth electrical contact member 36, 37 are configured to become electrically
5 connected with the battery 5 when the battery section 4 is coupled to the liquid section 3.

As shown in the figures 2 and 4B, the battery section 4 comprises a fifth electrical contact member 43 and a sixth electrical contact member 44 which are in contact with the anode and the cathode of the battery 5, respectively. The liquid section 3 and the battery
10 section 4 are configured to place the third electrical contact member 36 and the fourth electrical contact member 36 in contact with the fifth electrical contact member 43 and the sixth electrical contact member 44, respectively, when the liquid section 3 is coupled to the battery section 4.

The first liquid part 31 is provided with the first support member 21 and the second liquid part 32 is provided with the second support member 22.

15 The liquid reservoir 8 is provided with a further liquid outlet 9B located adjacent to the combined construction 12. The combined construction 12 comprises a first construction end 40, a second construction end 41 and an intermediate construction part 42 which is located between the first construction end 40 and the second construction end 41. The first construction end 40 is located at the liquid outlet 9A, the second construction end 41 is
20 located at the further liquid outlet 9B and the air duct 10 is located at the intermediate construction part 42.

The first liquid part 31 is formed as a first single piece, more specifically by injection moulding. This allows that the first liquid part 31 is produced in a cost efficient manner.

The second liquid part 32 is formed as a second single piece. The second liquid part
25 32 can be formed by injection moulding on electrically conductive material or by injection moulding in a first production step and electrically conductive material is deposited in a second production step. This allows that the second liquid part 32 is produced in a cost efficient manner.

Figure 8 shows an exploded view of the liquid section 3 of fig. 5. Different views of the
30 first liquid part 31 and the second liquid part 32 are shown in the figures 9 and 10, respectively.

Figure 11 shows a top view of a first embodiment of the combined construction 12 of the liquid section of fig. 5. The wick 6 of the combined construction 12 is formed by a fibrous material 24. The fibrous material 24 is a fibre rope. The heating member 7 of the combined
35 construction 12 is formed by an electrically conductive wire 25. The electrically conductive wire 25 extends along the entire length L of the wick. The electrically conductive wire 25 is wound in a helical form around the wick 6.

Figure 12 shows a top view of a second embodiment of the combined construction 12 of the liquid section of fig. 5. The wick 6 of the combined construction 12 is formed by a ceramic material 45. The ceramic material 45 has a porous structure. The heating member 7 is formed by an electrically conductive additive 46 provided in the ceramic material 45. The electrically conductive additive 46 provides the electrical conductivity through the combined construction 12 and along its outer surface 13.

The figure 13-16 schematically shows a first embodiment of the method of producing the e-cigarette 1. The method comprises the steps of providing the combined construction 12 and positioning it on the liquid section 3 (see the figures 13 and 14). After that, the first and second contact members 14, 15 are placed in contact with the outer surface 13 of the combined construction 12 without attaching the first and second contact members 14, 15 to the combined construction 12 (see the figures 15 and 16). This allows that the method is performed mechanically in an efficient manner.

In the shown method, the combined construction 12 is placed on the first support member 21, and the second support member 22 is placed in contact with the combined construction 12 such that the combined construction 12 is held in a fixed position 23.

The combined construction 12 is placed in the first liquid part 31 such that the combined construction 12 extends along the liquid outlet 9A, 9B and the air duct 10, and the second liquid part 32 is subsequently coupled to the first liquid 31 part such that the second liquid part 32 is located in the coupled position 35 while the first and second electrical contact members 14, 15 contact electrically conductive parts 18A, 18B at the outer surface 13 of the combined construction 12.

The method further comprises coupling the liquid section 3 and the battery section 4 to each other (see figure 1). The method comprises the steps of coupling the liquid section 3 to the battery section 4 such that the third electrical contact member 36 and the fourth electrical contact member 37 of the liquid section 3 are in contact with the fifth electrical contact member 43 and the sixth electrical contact member 44 of the battery section 4 (see figure 2).

The figures 17-21 show a second embodiment of the e-cigarette 1 according to the invention. The outside of the housing 2 of the second embodiment looks similar to the first embodiment as shown in figure 1. The combined construction 12 is located in the battery section 4. The battery section 4 comprises a first battery part 51 and a second battery part 52. The first battery part 51 is provided with the battery 5. The first battery part 51 comprises a first coupling member 33 and the second battery part 52 comprises a second coupling member 34 which is configured to cooperate with the first coupling member 33 to couple the second battery part 52 to the first battery part 51 such that the second battery part 52 is located in a coupled position 35. The first and second contact members 14, 15 are provided

on the first battery part 51. The first battery part 51 is provided with the first support member 21 and the second battery part 52 is provided with the second support member 22.

The method of producing the second embodiment of the e-cigarette 1 comprises the steps of providing the combined construction and positioning it on the battery section 4, and
5 placing first and second contact members 14, 15 in contact with the outer surface 13 of the combined construction 12 without attaching the first and second contact members 14, 15 to the combined construction 12.

The method further comprises the steps of placing the combined construction 12 in the first battery part 51, and subsequently coupling the second battery part 52 to the first
10 battery part 51 such that the second battery part 52 is located in the coupled position 35 while the first and second electrical contact members 14, 15 contact electrically conductive parts 18A, 18B at the outer surface 13 of the combined construction 12.

As required, detailed embodiments of the present invention are disclosed herein; however, it is to be understood that the disclosed embodiments are merely exemplary of the
15 invention, which can be embodied in various forms. Therefore, specific structural and functional details disclosed herein are not to be interpreted as limiting, but merely as a basis for the claims and as a representative basis for teaching one skilled in the art to variously employ the present invention in virtually any appropriately detailed structure. Further, the terms and phrases used herein are not intended to be limiting, but rather, to provide an
20 understandable description of the invention.

The terms "a" or "an", as used herein, are defined as one or more than one. The terms including and/or having, as used herein, are defined as comprising (i.e., open language, not excluding other elements or steps). Any reference signs in the claims should not be construed as limiting the scope of the claims or the invention.

25 It will be apparent to those skilled in the art that various modifications can be made to the devices and methods shown in the figures without departing from the scope as defined in the claims.

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CONCLUSIES

1. E-sigaret omvattende:

- 5 - een behuizing met een vloeistofgedeelte voor het houden van een vloeistof en een batterijgedeelte voor het houden van een batterij, waarbij het vloeistofgedeelte en het batterijgedeelte zijn ingericht om aan elkaar te worden gekoppeld,
- een lont om de vloeistof op te nemen, en
- een verwarmingsorgaan voor het verwarmen van de lont, waarbij
- 10 -- het vloeistofgedeelte een vloeistofreservoir, verschaft met een vloeistofuitlaat voor de toevoer van vloeistof naar de lont, en een luchtkanaal voor het creëren van een luchtstroom langs de lont en naar een luchtuitlaat omvat,
- het verwarmingsorgaan en de lont zijn gecombineerd voor het vormen van een gecombineerde constructie met een buitenoppervlak welke ten minste gedeeltelijk elektrisch
- 15 geleidend is, en
- de e-sigaret een eerste elektrisch contactorgaan dat elektrisch verbonden is met een anode van een batterij en een tweede elektrisch contactorgaan dat elektrisch verbonden is met een kathode van de batterij omvat, waarbij de eerste en tweede elektrische contactorganen in contact staan met geleidende delen van het buitenoppervlak van de gecombineerde constructie zonder met deze verbonden te zijn.
- 20

2. E-sigaret volgens conclusie 1, waarbij de gehele gecombineerde constructie zich langs een substantieel rechte lijn uitstrekt.

- 25 3. E-sigaret volgens conclusies 1 of 2, waarbij de gecombineerde constructie een uitgerekte vorm heeft die zich langs zijn longitudinale as uitstrekt.

- 4. E-sigaret volgens een der voorgaande conclusies, waarbij de gecombineerde constructie een zodanige stijfheid heeft dat het zijn vorm behoudt wanneer het mechanisch
- 30 wordt behandeld, zoals gedurende de mechanische pak en plaats operatie.

5. E-sigaret volgens een der voorgaande conclusies, waarbij de gecombineerde constructie een zodanige stijfheid heeft dat het zijn vorm behoudt wanneer het wordt onderworpen aan de zwaartekracht.

6. E-sigaret volgens een der voorgaande conclusies, waarbij de eerste en tweede elektrische contactorganen zich op afstand van elkaar bevinden langs de longitudinale as van de gecombineerde constructie.

5 7. E-sigaret volgens een der voorgaande conclusies, waarbij de gecombineerde constructie zich tussen een eerste steunorgaan en een tegenoverstaand tweede steunorgaan bevindt om de gecombineerde constructie op een vaste plek te houden.

8. E-sigaret volgens conclusie 7, waarbij de eerste en tweede elektrische contactorganen zijn aangebracht op het eerste steunorgaan.
10

9. E-sigaret volgens conclusie 7, waarbij de eerste en tweede elektrische contactorganen zijn aangebracht op het tweede steunorgaan.

15 10. E-sigaret volgens een van de conclusies 7-9, waarbij de gecombineerde constructie in contact staat met de eerste en tweede steunorganen zonder met deze verbonden te zijn.

11. E-sigaret volgens een der voorgaande conclusies, waarbij de gecombineerde constructie vrij is van elk verbonden contact met de e-sigaret.
20

12. E-sigaret volgens een der voorgaande conclusies, waarbij de lont van de gecombineerde constructie wordt gevormd door een keramisch materiaal.

13. E-sigaret volgens een van de conclusies 1-11, waarbij de lont van de gecombineerde constructie wordt gevormd door een vezelachtig materiaal.
25

14. E-sigaret volgens een der voorgaande conclusies, waarbij het verwarmingsorgaan van de gecombineerde constructie wordt gevormd door een elektrisch geleidende draad.

30 15. E-sigaret volgens conclusie 14, waarbij de elektrisch geleidende draad zich uitstrekt langs de gehele lengte van de lont.

16. E-sigaret volgens conclusie 14, waarbij de elektrisch geleidende draad schroefvormig om de lont is gewikkeld.
35

17. E-sigaret volgens conclusie 13, waarbij het verwarmingsorgaan wordt gevormd door een elektrisch geleidende toevoeging verschaft in het keramische materiaal.

18. E-sigaret volgens een der voorgaande conclusies, waarbij de gecombineerde constructie zich in het vloeistofgedeelte bevindt.

19. E-sigaret volgens conclusie 18, volgens de voorgaande conclusie, waarbij

- het vloeistofgedeelte een eerste vloeistofdeel en een tweede vloeistofdeel omvat,
- het eerste vloeistofdeel is voorzien van het vloeistofreservoir en de luchttuitlaat,
- 10 - de vloeistofuitlaat grenst aan de gecombineerde constructie,
- het luchtkanaal zich uitstrekt van de gecombineerde constructie tot de luchttuitlaat,
- het eerste vloeistofdeel een eerste koppelorgaan omvat en het tweede vloeistofdeel een tweede koppelorgaan omvat welke is ingericht om samen te werken met het eerste koppelorgaan om het tweede koppelorgaan zodanig aan het eerste koppelorgaan te koppelen dat het tweede vloeistofdeel zich in een gekoppelde positie bevindt, en
- 15 - de eerste en tweede steunorganen zijn aangebracht op het tweede vloeistofdeel.

20. E-sigaret volgens conclusie 19, waarbij het tweede vloeistofdeel een derde elektrisch contactorgaan omvat die elektrisch verbonden is met het eerste elektrisch contactorgaan en een vierde elektrisch contactorgaan die elektrisch verbonden is met het tweede elektrisch contactorgaan, waarbij de derde en vierde elektrische contactorganen zijn ingericht om elektrisch te worden verbonden met de batterij wanneer het batterijgedeelte is gekoppeld aan het vloeistofgedeelte.

21. E-sigaret volgens conclusie 19 of 20, waarbij het eerste vloeistofdeel is voorzien van het eerste steunorgaan en het tweede vloeistofdeel is voorzien van het tweede steunorgaan.

22. E-sigaret volgens een van de conclusies 18-21, waarbij

- het vloeistofreservoir is voorzien van een verdere vloeistofuitgang grenzend aan de gecombineerde constructie,
- de gecombineerde constructie een eerste constructie-einde, een tweede constructie-einde en een tussenliggend constructiedeel welke zich tussen het eerste constructie-einde en het tweede constructie-einde bevindt omvat, en

- het eerste constructie-einde zich bevindt bij de vloeistofuitgang, het tweede constructie-einde zich bevindt bij de verdere vloeistofuitgang en het luchtkanaal zich bevindt bij het tussenliggende constructiedeel.

5 23. E-sigaret volgens een van de conclusies 18-22, waarbij

- het batterijgedeelte een vijfde elektrisch contactorgaan en een zesde elektrisch contactorgaan omvat welke in contact staan met respectievelijk de anode en kathode van de batterij, en

10 - het vloeistofgedeelte en het batterijgedeelte zijn ingericht om het derde elektrisch contactorgaan en het vierde elektrisch contactorgaan contact te laten maken met respectievelijk het vijfde elektrisch contactorgaan en het zesde elektrisch contactorgaan, wanneer het vloeistofgedeelte aan het batterijgedeelte is gekoppeld.

15 24. E-sigaret volgens een van de conclusies 19-23, waarbij het eerste vloeistofdeel is gevormd als een eerste enkelvoudig stuk.

25. E-sigaret volgens een van de conclusies 19-24, waarbij het eerste vloeistofdeel is gevormd door spuitgieten.

20 26. E-sigaret volgens een van de conclusies 19-25, waarbij het tweede vloeistofdeel is gevormd als een tweede enkelvoudig stuk.

25 27. E-sigaret volgens een van de conclusies 19-26, waarbij het tweede vloeistofdeel wordt gevormd door spuitgieten op een elektrisch geleidend materiaal of door spuitgieten in een eerste productiestap en het afzetten van elektrisch geleidend materiaal in een tweede productiestap.

30 28. E-sigaret volgens een van de conclusies 1-17, waarbij de gecombineerde constructie zich in het batterijgedeelte bevindt.

29. E-sigaret volgens conclusie 28, volgens de voorgaande conclusie, waarbij

- het batterijgedeelte een eerste batterijdeel en een tweede batterijdeel omvat,

- het eerste batterijdeel is voorzien van de batterij,

35 - het eerste batterijdeel een eerste koppelorgaan omvat en het tweede batterijdeel een tweede koppelorgaan omvat welke is ingericht om samen te werken met het eerste koppel-

orgaan om het tweede batterijdeel zodanig aan het eerste batterijdeel te koppelen dat het tweede batterijdeel zich in een gekoppelde positie bevindt, en

- de eerste en tweede contactorganen zijn aangebracht op het eerste batterijdeel.

5 30. E-sigaret volgens conclusie 28 of 29, waarbij het eerste batterijdeel is voorzien van het eerste steunorgaan en het tweede batterijdeel is voorzien van het tweede steunorgaan.

31. Werkwijze voor het produceren van een e-sigaret volgens een der voorgaande conclusies, waarbij de werkwijze de stappen omvat van:

- 10
- het verschaffen van de gecombineerde constructie en het positioneren ervan in het vloeistofgedeelte of het batterijgedeelte, en
 - het in contact brengen van de eerste en tweede contactorganen met het buitenoppervlak van de gecombineerde constructie zonder de eerste en tweede contactorganen te verbinden met de gecombineerde constructie.

15

32. Werkwijze volgens conclusie 31, waarbij de werkwijze de stap omvat van:

- het plaatsen van de gecombineerde constructie op het eerste steunorgaan, en
- het zodanig in contact brengen van het tweede steunorgaan met de gecombineerde constructie dat de gecombineerde constructie in een vaste positie wordt gehouden.

20

33. Werkwijze volgens conclusie 31 of 32, waarbij de werkwijze de stap omvat van:

- het zodanig plaatsen van de gecombineerde constructie in het eerste vloeistofdeel dat de gecombineerde constructie zich uitstrekt langs de vloeistofuitlaat en het luchtkanaal, en
- 25
- het vervolgens zodanig koppelen van het tweede vloeistofdeel aan het eerste vloeistofdeel dat het tweede vloeistofdeel zich in een gekoppelde positie bevindt terwijl de eerste en tweede elektrische contactorganen contact maken met de elektrisch geleidende delen aan het buitenoppervlak van de gecombineerde constructie.

30 34. Werkwijze volgens conclusie 31 of 32, waarbij de werkwijze de stap omvat van:

- het plaatsen van de gecombineerde constructie in het eerste batterijdeel, en
 - het vervolgens zodanig koppelen van het tweede batterijdeel aan het eerste batterijdeel dat het tweede batterijdeel zich in een gekoppelde positie bevindt terwijl de eerste en tweede elektrische contactorganen contact maken met de elektrisch geleidende delen aan
- 35 het buitenoppervlak van de gecombineerde constructie.

35. Werkwijze volgens een van de conclusies 31-34, waarbij het plaatsen van de gecombineerde constructie en het in contact brengen van de eerste en tweede contactorganen met de gecombineerde constructie mechanisch wordt uitgevoerd.

5 36. Werkwijze volgens een van de conclusies 31-35, waarbij de werkwijze de stap van het aan elkaar koppelen van het vloeistofgedeelte en het batterijgedeelte omvat.

37. Werkwijze volgens een van de conclusies 31-36, waarbij de werkwijze de stappen omvat van het zodanig koppelen van het vloeistofgedeelte aan het batterijgedeelte dat het
10 derde elektrische contactorgaan en het vierde elektrische contactorgaan van het vloeistofgedeelte in contact staan met het vijfde elektrisch contactorgaan en het zesde elektrisch contactorgaan van het batterijgedeelte.

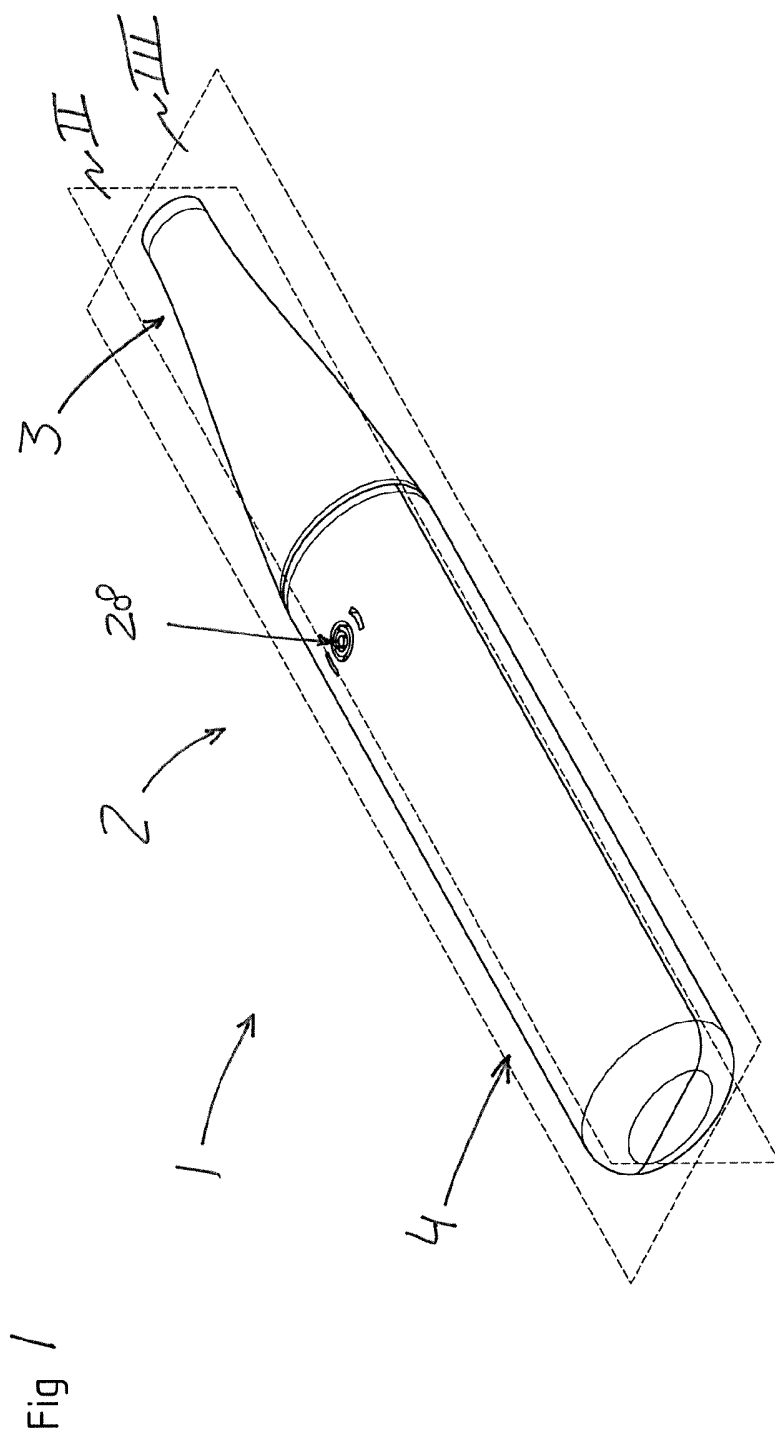


Fig 2

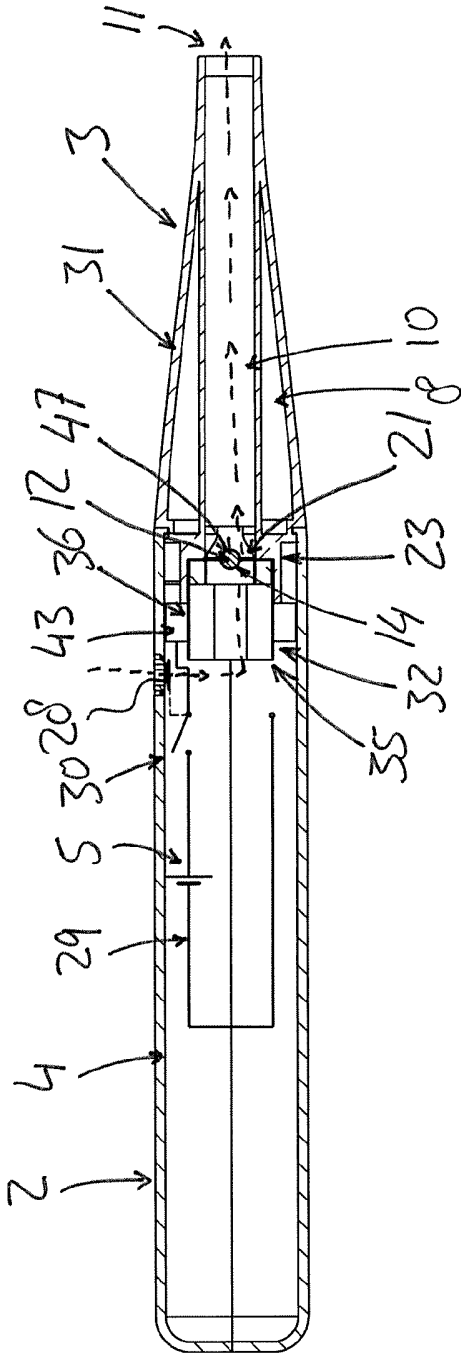
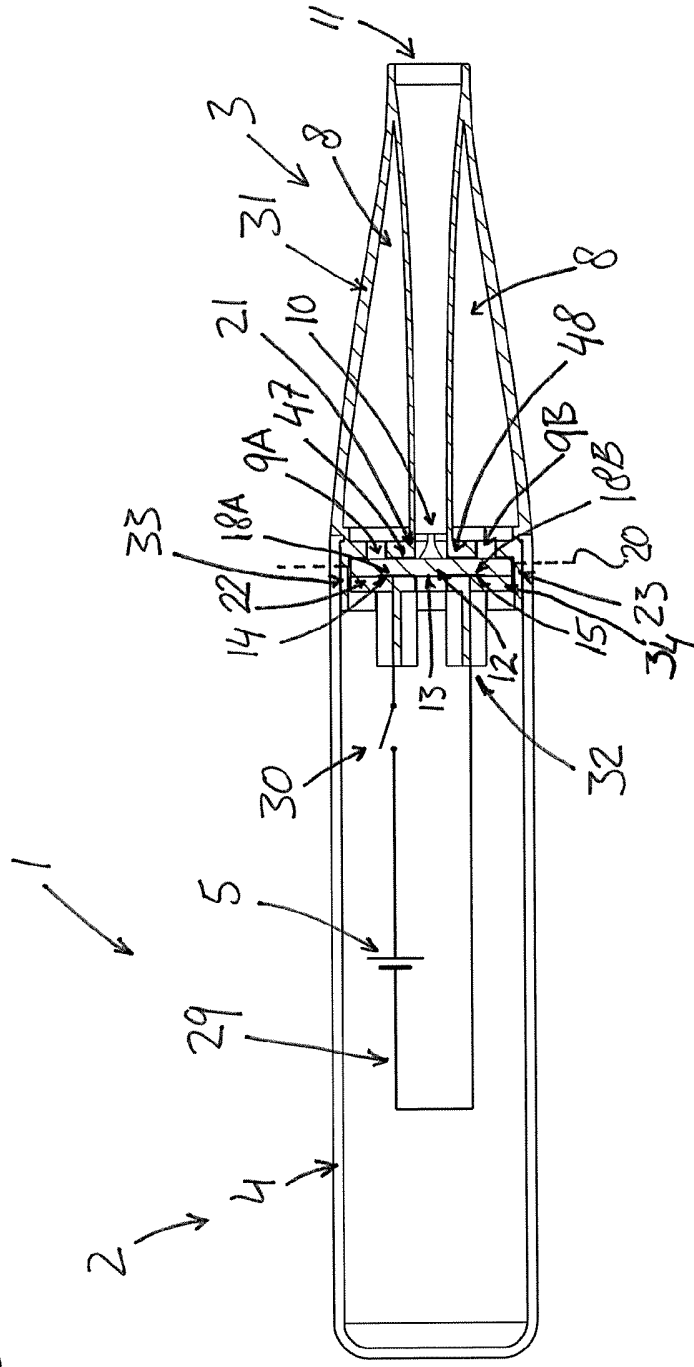


Fig 3



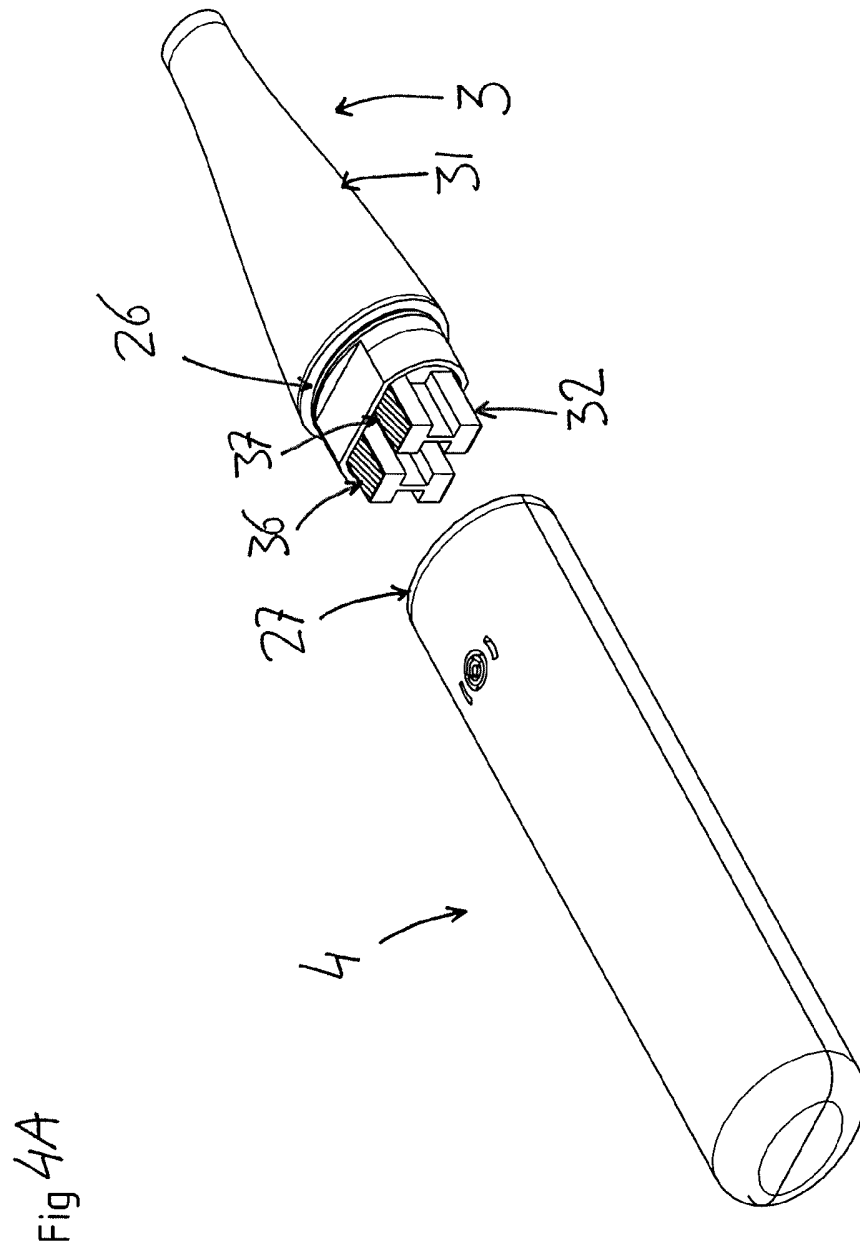
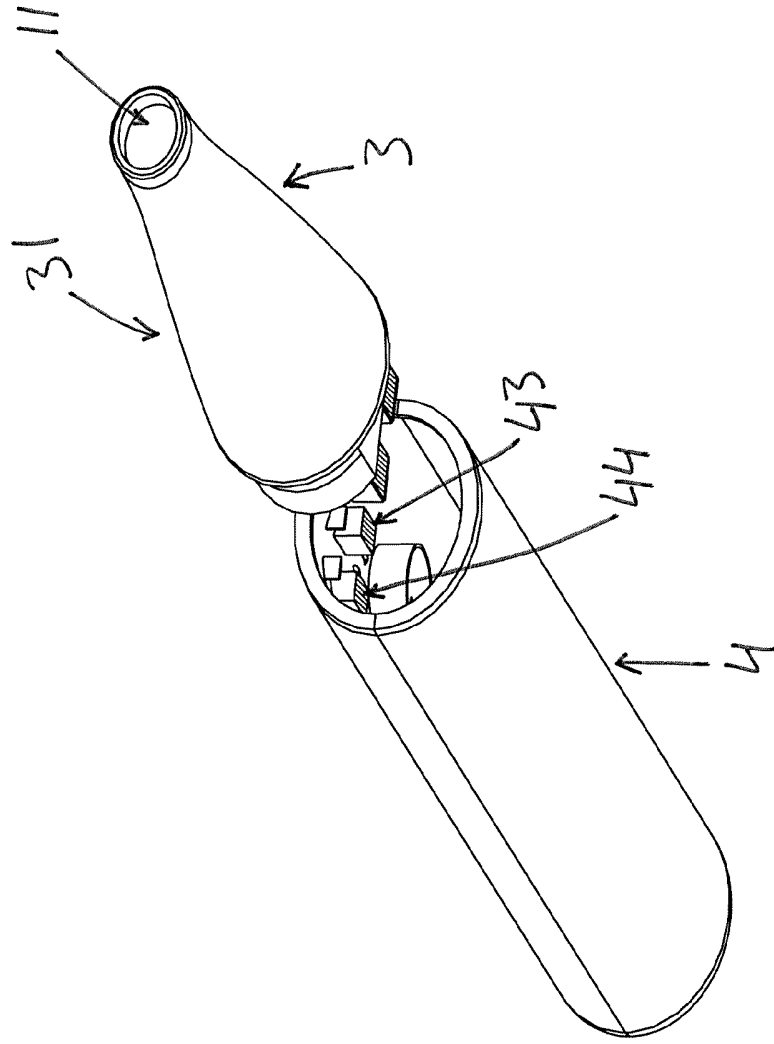


Fig 4B



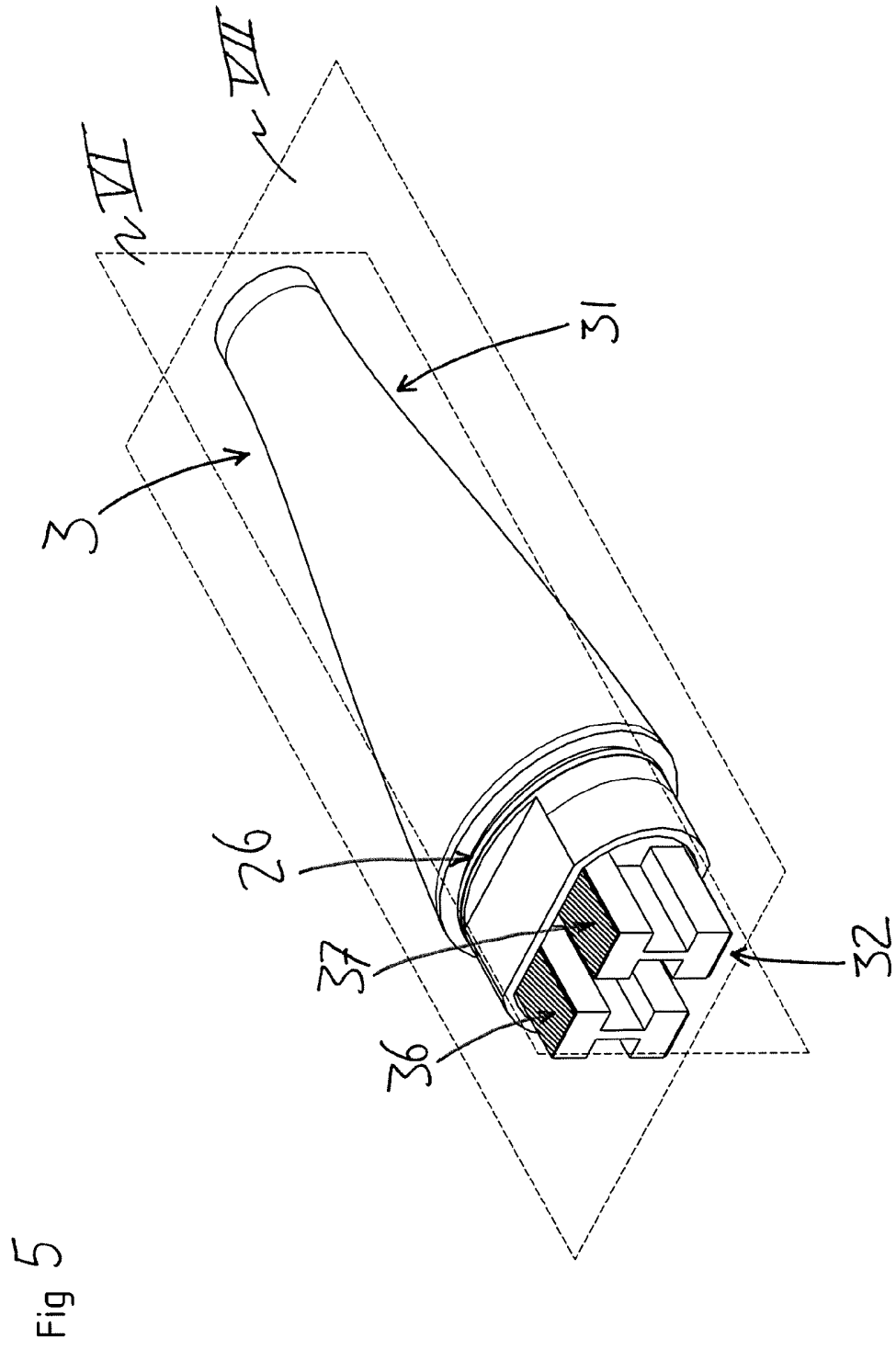


Fig 6

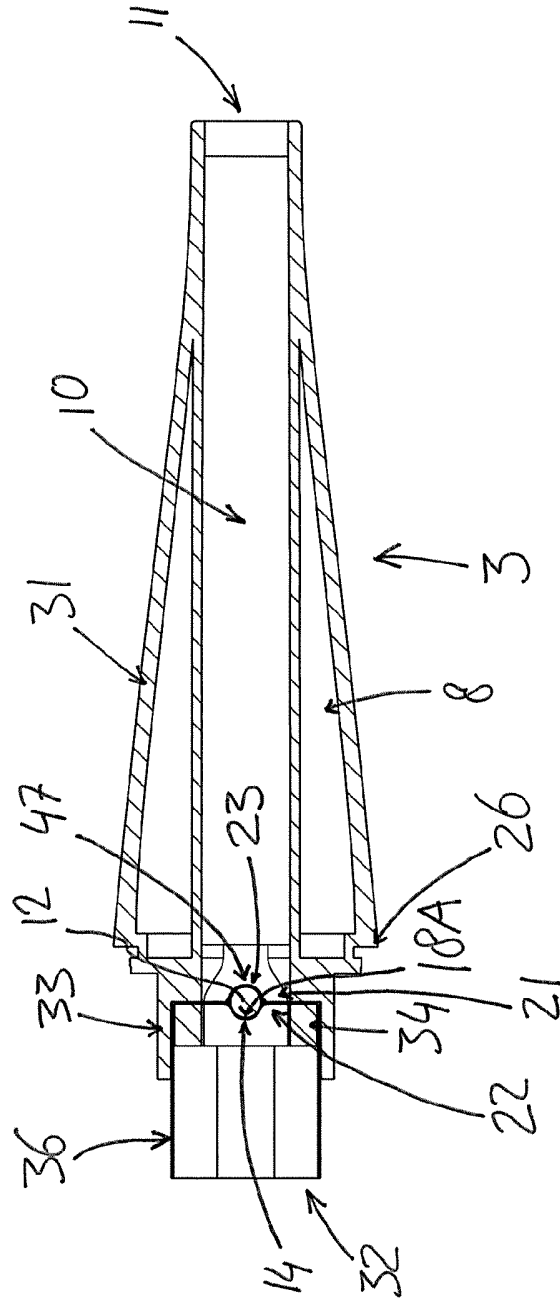


Fig 7

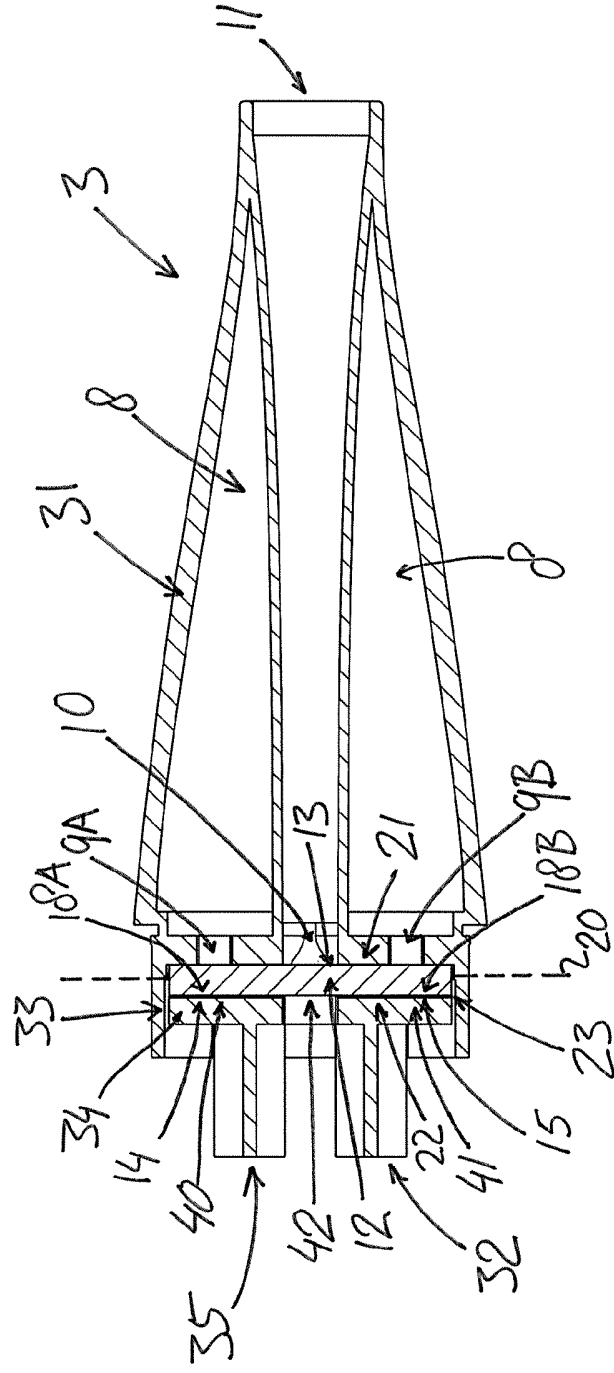


Fig 8

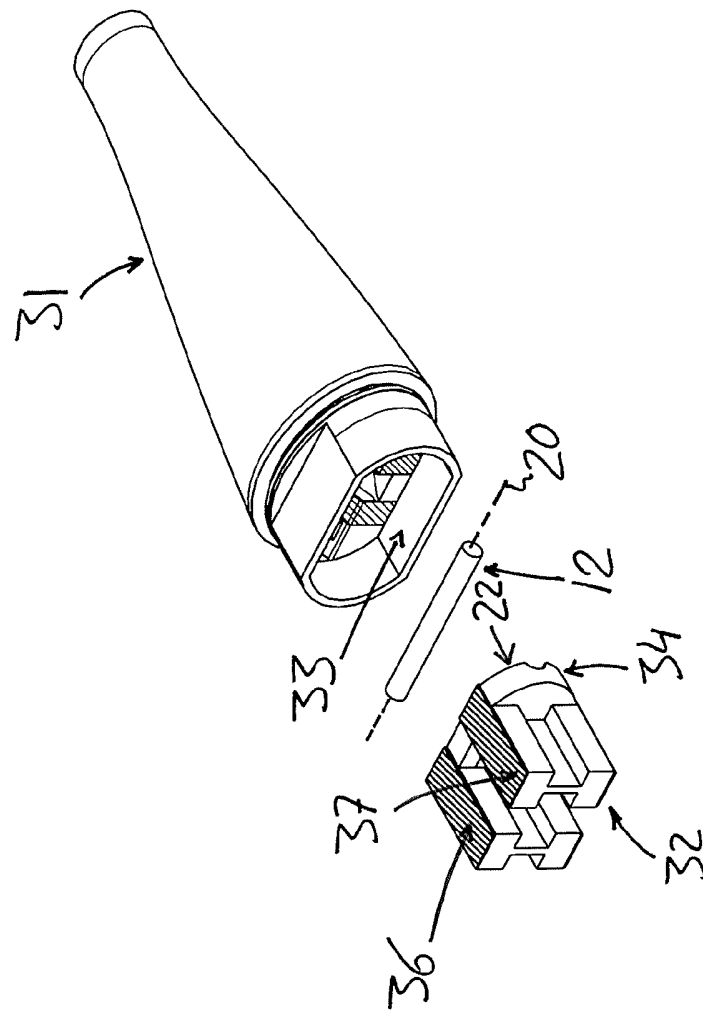
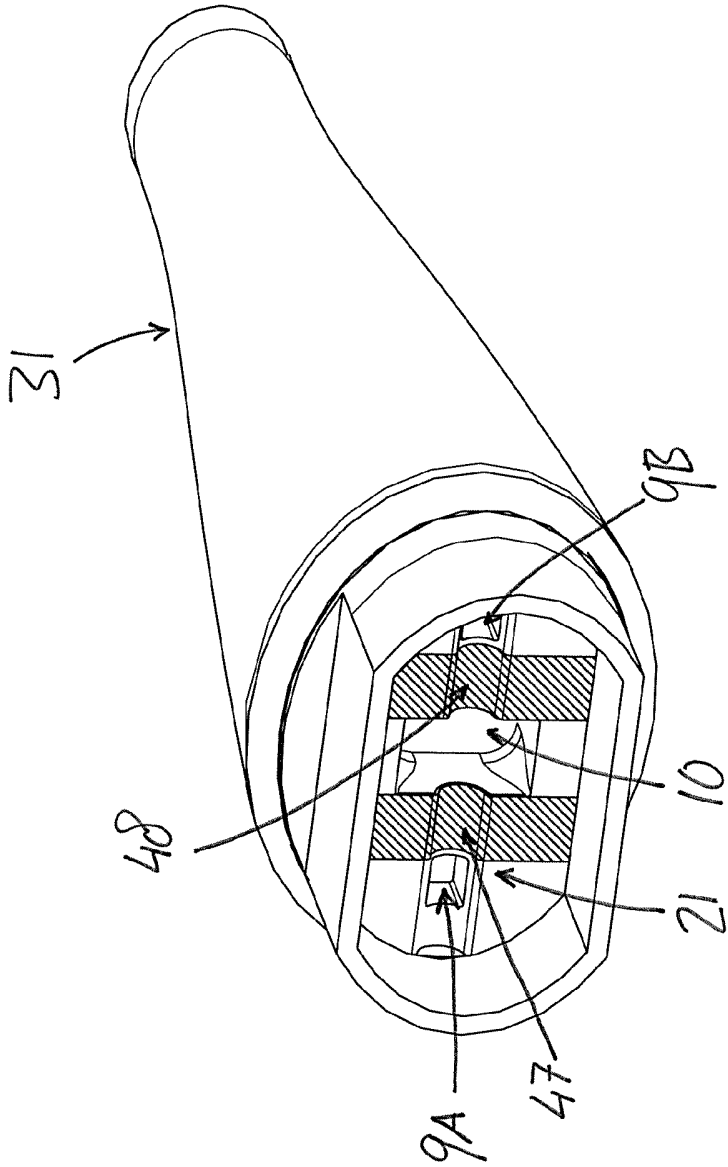


Fig 9



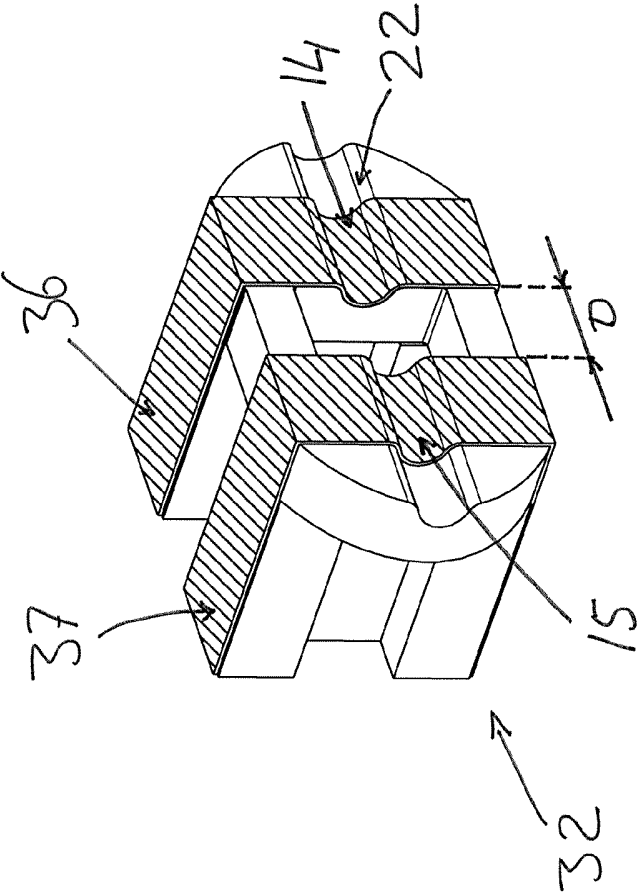
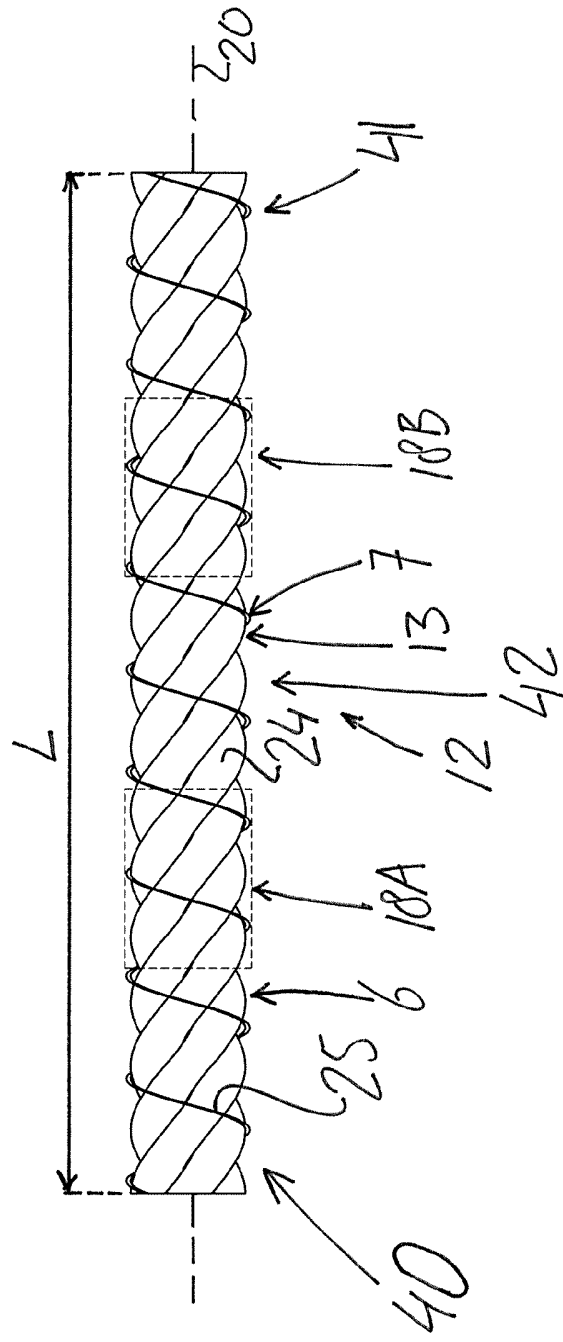


Fig 10

Fig //



Fig/2

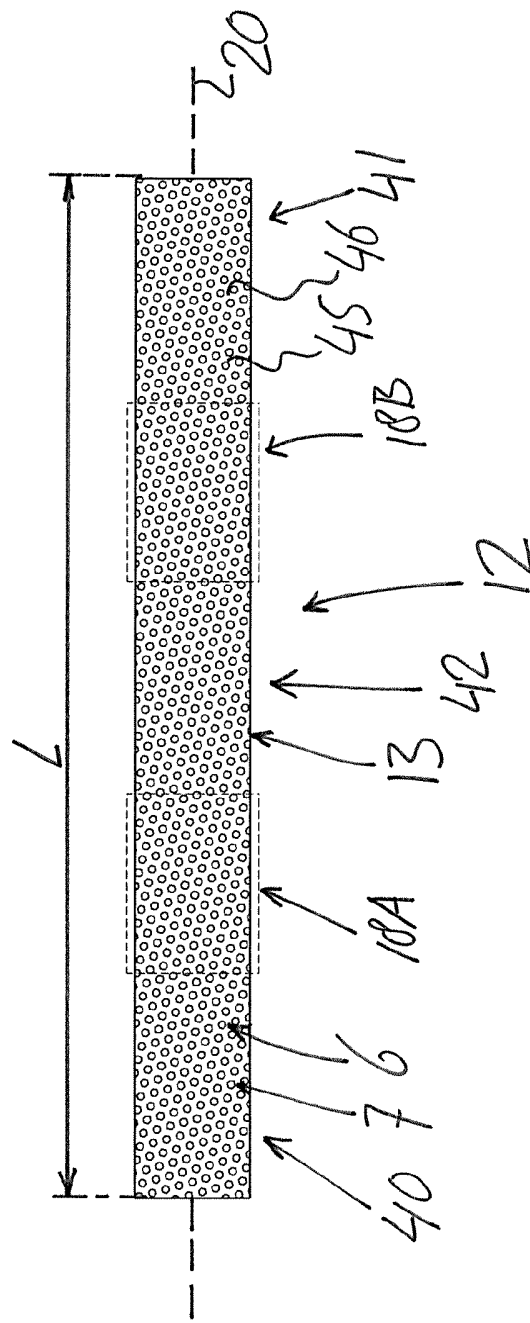


Fig 13

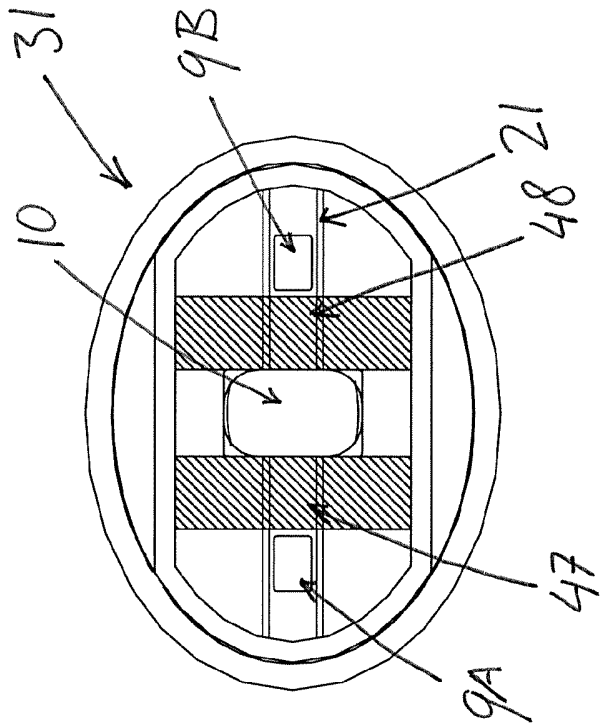
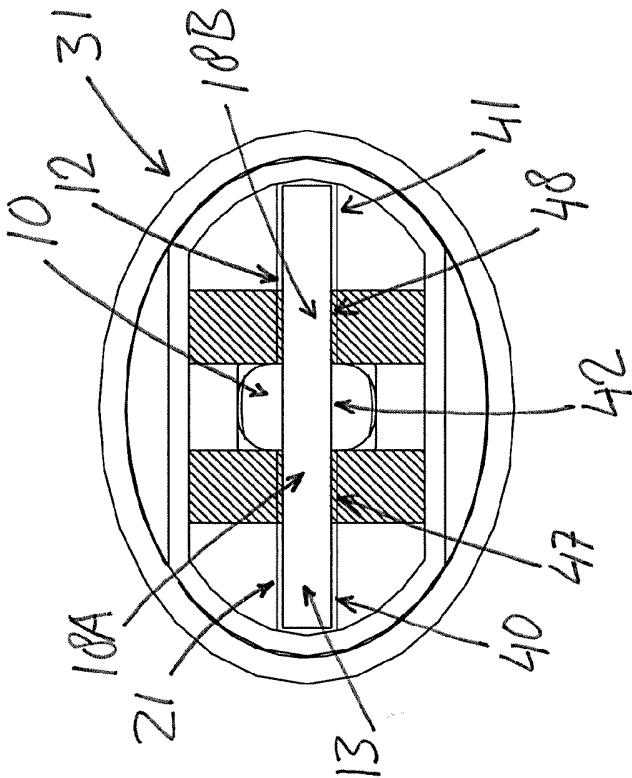


Fig 14



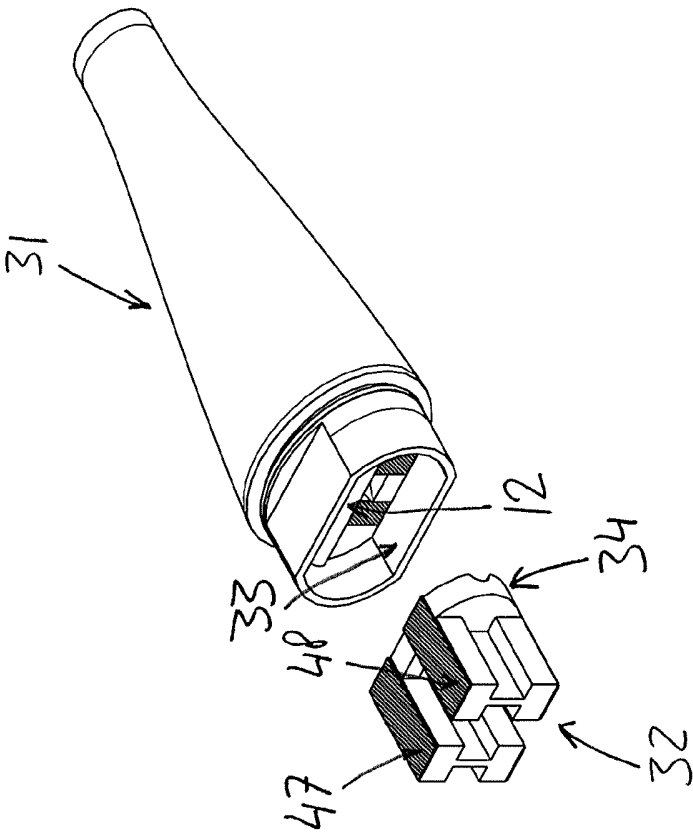


Fig 15

Fig 16

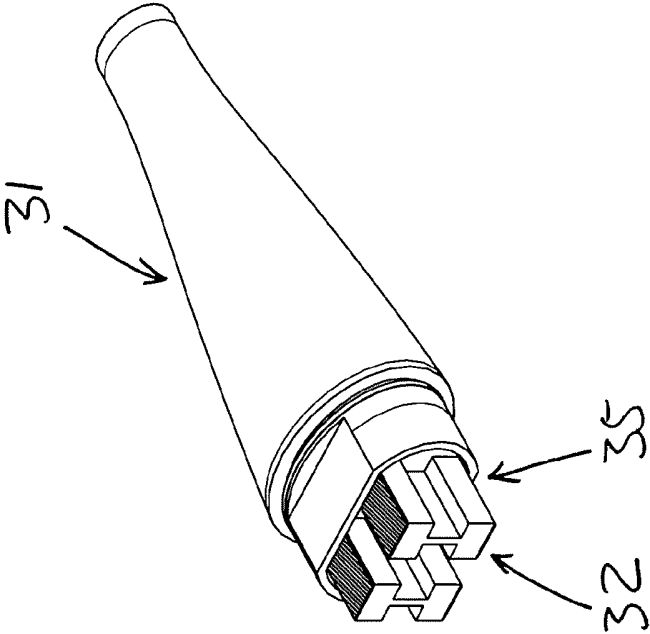


Fig 17

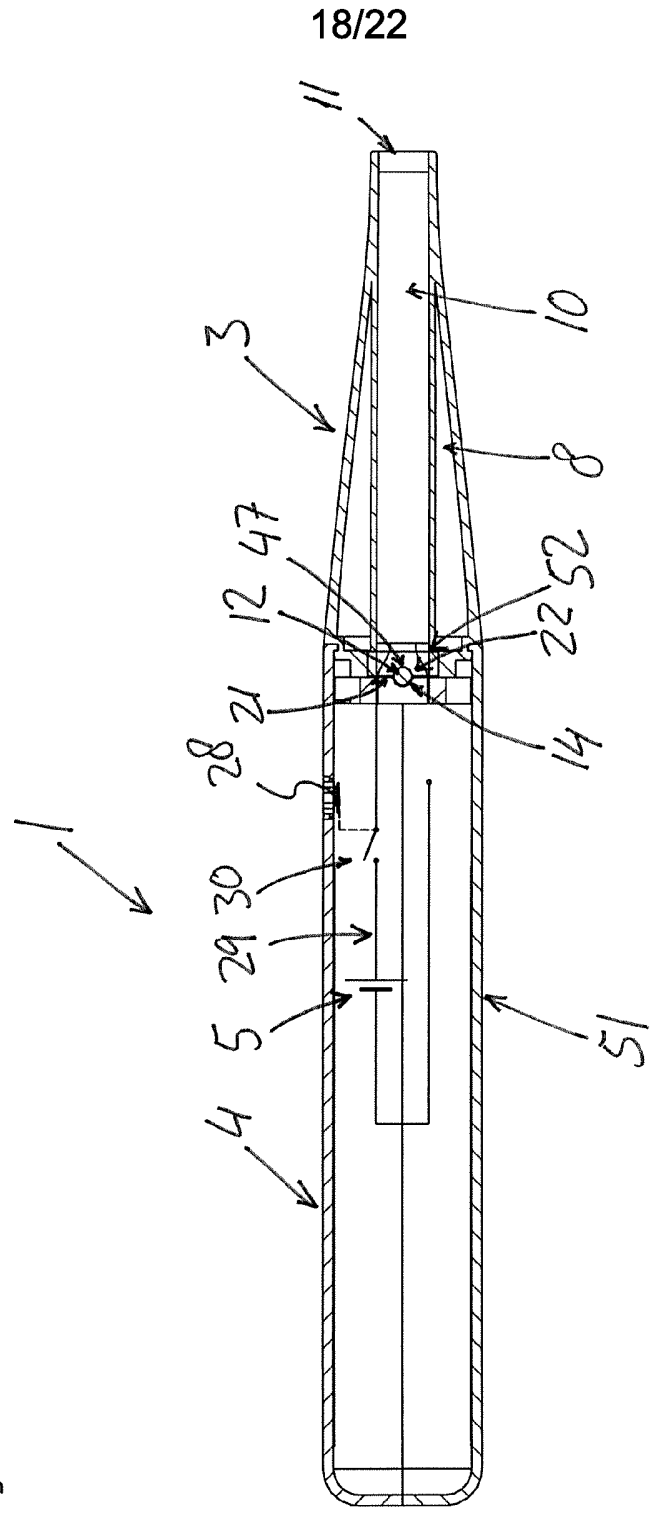
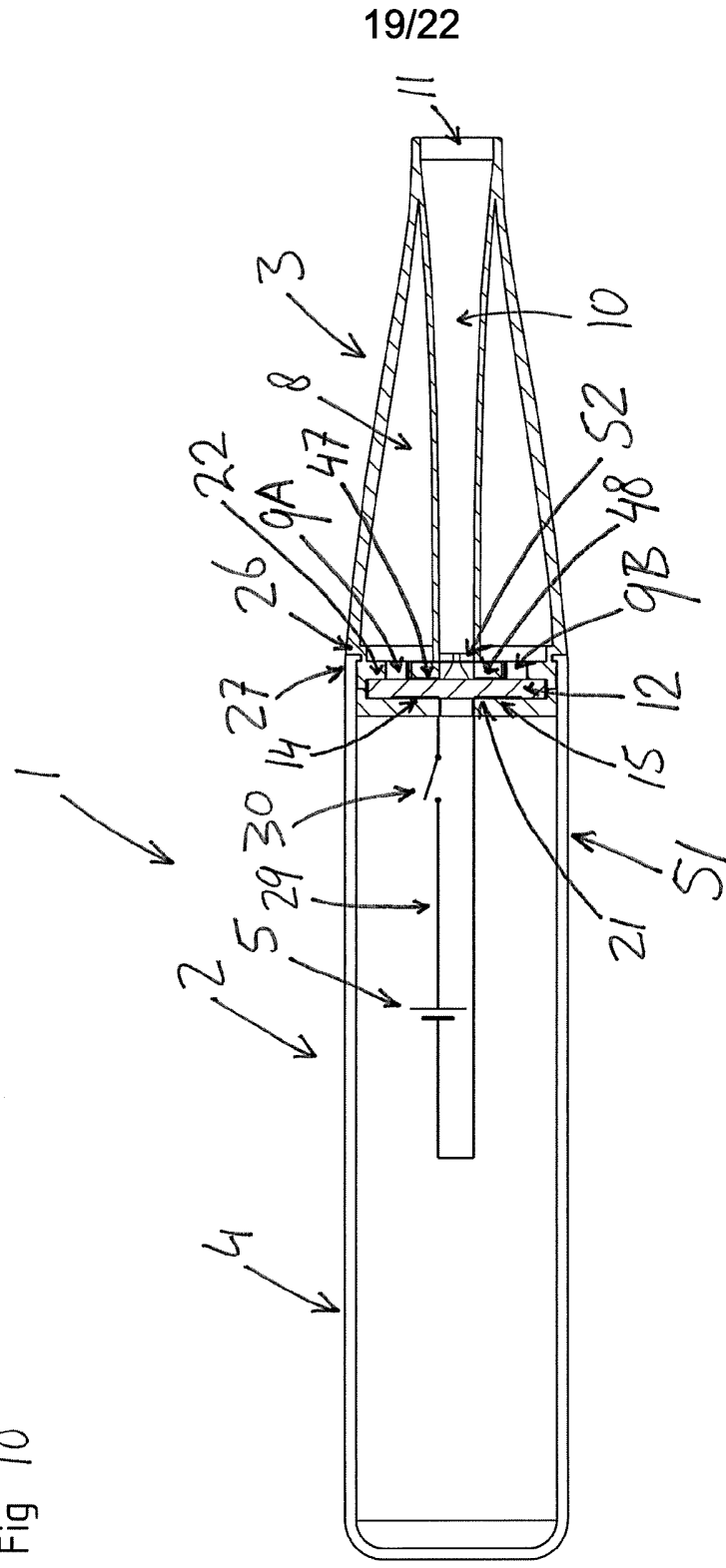


Fig 18



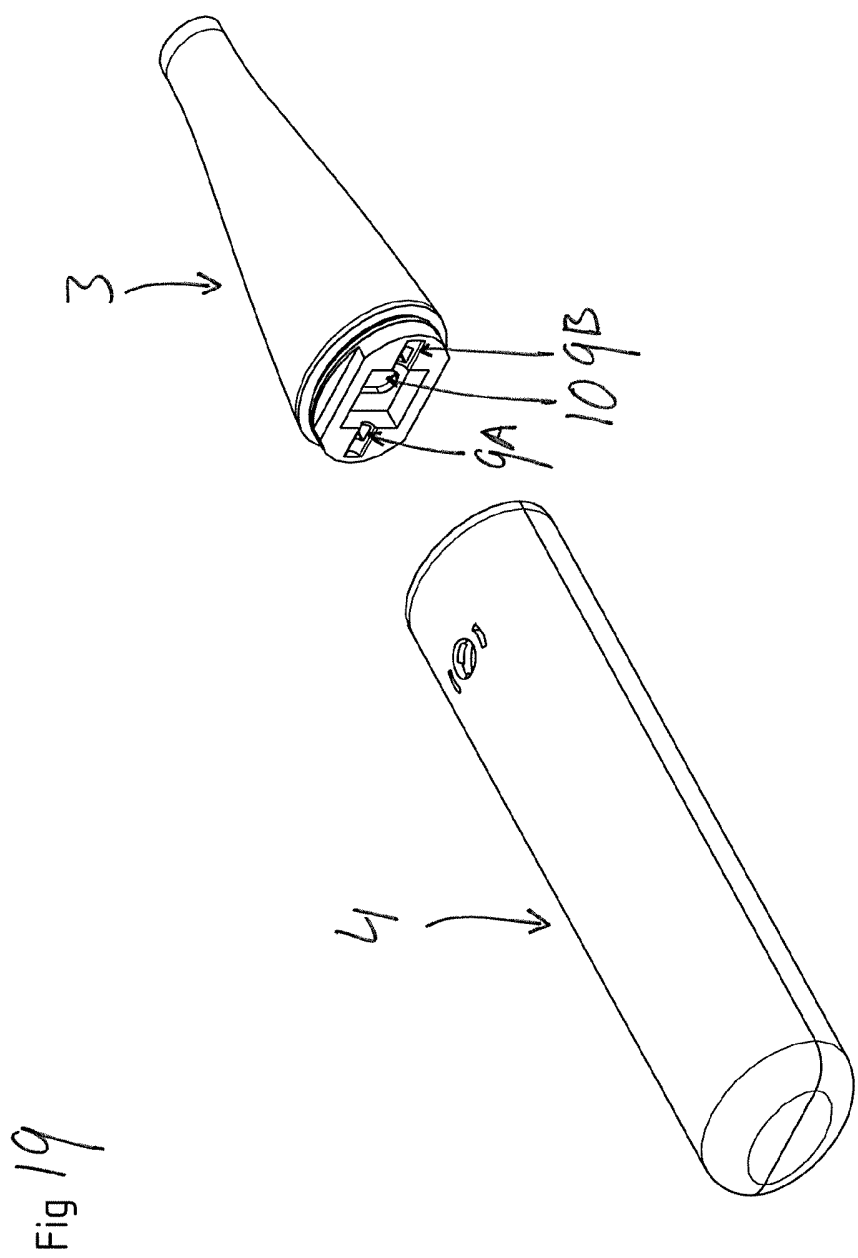


Fig 19

Fig 20

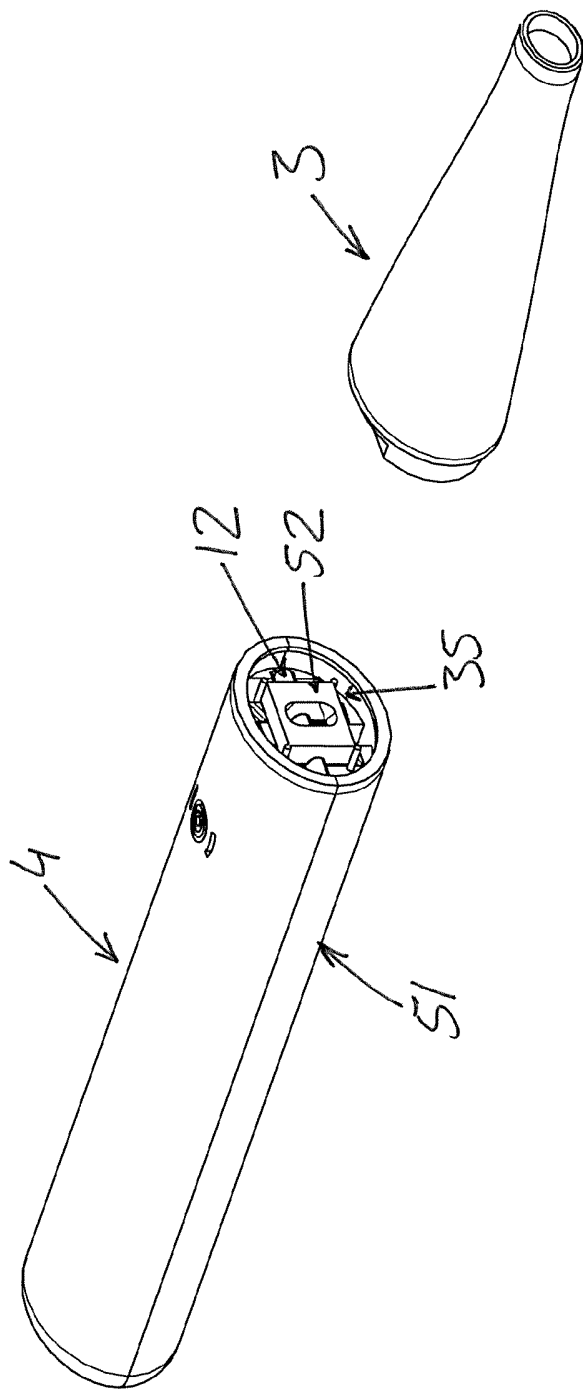
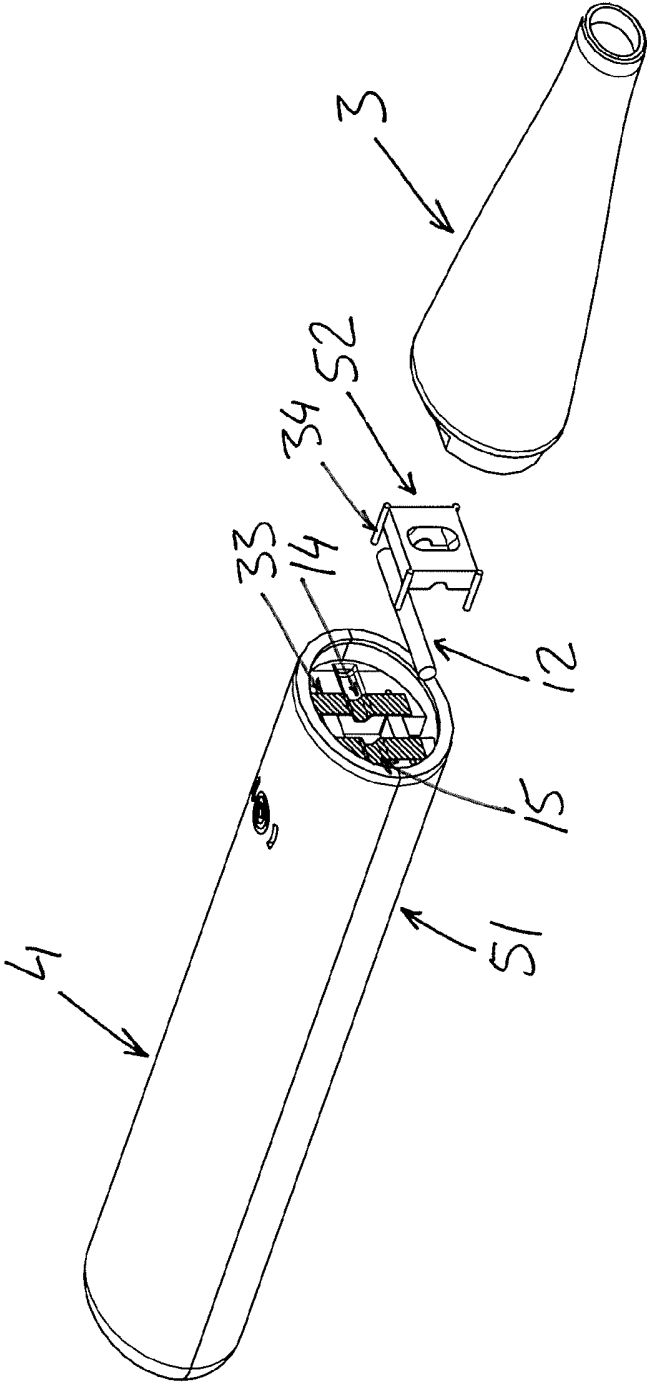


Fig 21



ABSTRACT

E-cigarette comprising a housing having a liquid section for holding a liquid and a battery section for holding a battery, which liquid section and battery section are configured to be coupled to each other, and a wick to take up the liquid, a heating member for heating the wick, wherein the liquid section comprises a liquid reservoir provided with a liquid outlet to
5 supply liquid to the wick and an air duct to create an air flow along the wick and to an air outlet.

SAMENWERKINGSVERDRAG (PCT)

RAPPORT BETREFFENDE NIEUWHEIDSONDERZOEK VAN INTERNATIONAAL TYPE

IDENTIFICATIE VAN DE NATIONALE AANVRAGE	KENMERK VAN DE AANVRAGER OF VAN DE GEMACHTIGDE	
	P32710NL00/JKO	
Nederlands aanvraag nr.	Indieningsdatum	
2016548	04-04-2016	
	Ingeroepen voorrangsdatum	
Aanvrager (Naam)		
Sluis Cigar Machinery B.V.		
Datum van het verzoek voor een onderzoek van internationaal type	Door de instantie voor Internationaal Onderzoek aan het verzoek voor een onderzoek van internationaal type toegekend nr.	
13-08-2016	SN67092	
I. CLASSIFICATIE VAN HET ONDERWERP (bij toepassing van verschillende classificaties, alle classificatiesymbolen opgeven)		
Volgens de internationale classificatie (IPC)		
A24F47/00		
II. ONDERZOCHE GEBIEDEN VAN DE TECHNIEK		
Onderzochte minimumdocumentatie		
Classificatiesysteem	Classificatiesymbolen	
IPC	A24F	
Onderzochte andere documentatie dan de minimum documentatie, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen		
III.	☐ GEEN ONDERZOEK MOGELIJK VOOR BEPAALDE CONCLUSIES	(opmerkingen op aanvullingsblad)
IV.	☐ GEBREK AAN EENHEID VAN UITVINDING	(opmerkingen op aanvullingsblad)

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Nummer van het verzoek om een onderzoek naar
de stand van de techniek

NL 2016548

A. CLASSIFICATIE VAN HET ONDERWERP
INV. A24F47/00
ADD.

Volgens de Internationale Classificatie van octrooien (IPC) of zowel volgens de nationale classificatie als volgens de IPC.

B. ONDERZOCHE GEBIEDEN VAN DE TECHNIEK

Onderzochte minimum documentatie (classificatie gevolgd door classificatiesymbolen)
A24F

Onderzochte andere documentatie dan de minimum documentatie, voor dergelijke documenten, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen

Tijdens het onderzoek geraadpleegde elektronische gegevensbestanden (naam van de gegevensbestanden en, waar uitvoerbaar, gebruikte trefwoorden)
EPO-Internal, BIOSIS, WPI Data

C. VAN BELANG GEACHTE DOCUMENTEN

Categorie *	Geciteerde documenten, eventueel met aanduiding van speciaal van belang zijnde passages	Van belang voor conclusie nr.
X	US 2013/192615 A1 (TUCKER CHRISTOPHER S [US] ET AL) 1 augustus 2013 (2013-08-01) * samenvatting * * alinea's [0026], [0053], [0071], [0072], [0076], [0080]; conclusies 1-7; figuren 1-8 *	1-31,36
E	WO 2016/131755 A1 (FONTEM HOLDINGS 1 B V [NL]) 25 augustus 2016 (2016-08-25) * samenvatting; figuren 1-5 *	1-36
A	US 2014/246020 A1 (MINSKOFF NOAH MARK [US] ET AL) 4 september 2014 (2014-09-04) * samenvatting; conclusies 1-16 *	1-36
A	US 2011/094523 A1 (THORENS MICHEL [CH] ET AL) 28 april 2011 (2011-04-28) * samenvatting; figuren 1-11 *	1-36

☐ Verdere documenten worden vermeld in het vervolg van vak C.

☒ Leden van dezelfde octrooifamilie zijn vermeld in een bijlage

*** Speciale categorieën van aangehaalde documenten**

"A" niet tot de categorie X of Y behorende literatuur die de stand van de techniek beschrijft

"D" in de octrooiaanvraag vermeld

"E" eerdere octrooi(aanvraag), gepubliceerd op of na de indieningsdatum, waarin dezelfde uitvinding wordt beschreven

"L" om andere redenen vermelde literatuur

"O" niet-schriftelijke stand van de techniek

"P" tussen de voorrangsdatum en de indieningsdatum gepubliceerde literatuur

"T" na de indieningsdatum of de voorrangsdatum gepubliceerde literatuur die niet bezwaarlijk is voor de octrooiaanvraag, maar wordt vermeld ter verheldering van de theorie of het principe dat ten grondslag ligt aan de uitvinding

"X" de conclusie wordt als niet nieuw of niet inventief beschouwd ten opzichte van deze literatuur

"Y" de conclusie wordt als niet inventief beschouwd ten opzichte van de combinatie van deze literatuur met andere geciteerde literatuur van dezelfde categorie, waarbij de combinatie voor de vakman voor de hand liggend wordt geacht

"Z" lid van dezelfde octrooifamilie of overeenkomstige octrooipublicatie

Datum waarop het onderzoek naar de stand van de techniek van internationaal type werd voltooid

22 september 2016

Verzenddatum van het rapport van het onderzoek naar de stand van de techniek van internationaal type

Naam en adres van de instantie

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

De bevoegde ambtenaar

Weijland, Albert

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Informatie over leden van dezelfde octrooifamilie

Nummer van het verzoek om een onderzoek naar
de stand van de techniek

NL 2016548

In het rapport genoemd octrooigescrift	Datum van publicatie	Overeenkomend(e) geschrift(en)	Datum van publicatie
US 2013192615	A1	01-08-2013	
		AR 091949 A1	11-03-2015
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		RU 2014135399 A	20-03-2016

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Informatie over leden van dezelfde octrooifamilie

Nummer van het verzoek om een onderzoek naar
de stand van de techniek

NL 2016548

In het rapport genoemd octrooigescrift	Datum van publicatie	Overeenkomend(e) geschrift(en)	Datum van publicatie	
		UA 111988 C2	11-07-2016	
		UA 112105 C2	25-07-2016	
		US 2013192615 A1	01-08-2013	
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			US 2016198772 A1	14-07-2016
			WO 2011050943 A1	05-05-2011
			ZA 201202994 B	30-01-2013

WRITTEN OPINION

File No. SN67092	Filing date (day/month/year) 04.04.2016	Priority date (day/month/year)	Application No. NL2016548
International Patent Classification (IPC) INV. A24F47/00			
Applicant Sluis Cigar Machinery B.V.			

This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☒ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the application
- ☐ Box No. VIII Certain observations on the application

	Examiner Weijland, Albert
--	------------------------------

WRITTEN OPINION

Application number
NL2016548

Box No. I Basis of this opinion

1. This opinion has been established on the basis of the latest set of claims filed before the start of the search.
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ on paper
 - ☐ in electronic form
 - c. time of filing/furnishing:
 - ☐ contained in the application as filed.
 - ☐ filed together with the application in electronic form.
 - ☐ furnished subsequently for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty	Yes: Claims	8-11, 19-30, 32-35, 37
	No: Claims	1-7, 12-18, 31, 36
Inventive step	Yes: Claims	
	No: Claims	1-37
Industrial applicability	Yes: Claims	1-37
	No: Claims	

2. Citations and explanations

see separate sheet

WRITTEN OPINION

Application number
NL2016548

Box No. VI Certain documents cited

- ☒ Certain published documents
 see the Search Report
- ☐ Non-written disclosures

Box No. VII Certain defects in the application

see separate sheet

The following documents (D) are referred to in this opinion; the numbering will be adhered to in the rest of the procedure:

D1: US2013/0192615

D2: WO2016/131755

SECTION V

1. Novelty

1.1 Claims 1-7, 12-18, 31 and 36 are not novel.

D1 (abstract; paragraphs 26, 53, 71, 72, 76, 80; claims 1-7; figures 1-8) describes an electronic smoking article comprising a first section 70 for liquid supply and a second section 72 having a battery, which can be coupled together using a threaded connection 205 or snug fit etc ("vloeistofgedeelte", "batterijgedeelte", "werkwijze voor het produceren van een e-sigaret", "het in contact brengen van de eerste en tweede contactorganen" according to claims 1, 31, 36). The first section includes a liquid supply ("vloeistofgedeelte" according to claim 1) and a wick ("lont" according to claim 1) in communication with a heater and liquid material, such that the wick delivers liquid material to the heater and at least one air passage ("luchtkanaal" according to claim 1) and a mouth end insert having at least two outlets. The heater can be a wire coil 14 ("verwarmingsorgaan", "draad" according to claims 1-7, 14-17) surrounding the wick 28 ("gecombineerde constructie" according to claim 1). The wick has a first end portion 29 and a second end portion 31, which extend into opposite sides into the storage medium 21 ("vloeistofgedeelte" according to claim 18), it preferably consists of glass filaments of ceramic material ("keramisch", "vezelachtig" according to claims 12, 13). The anode 47a of the battery 1 ("anode" according to claim 1) in the section section establishes an electrical connection with the heater coil 14 in the first section via 47b, 47c and 47d to electrical lead 109 of the heater coil 14. Likewise, an electrical connection between the cathode 49a ("kathode" according to claim 1) of the battery and the other lead 109' is established though the threaded connection 205 and 49b of the second portion ("buitenoppervlak van de gecombineerde constructie" according to claim 1). At least one air inlet 45 is located adjacent to the puff sensor 16 and indicates air flow, indicative of a smoker taking a puff and which activates the power supply.

1.2 Claims 8-11, 19-30, 32-35, 37 are novel.

2. Inventive Step

Dependent claims 8-11, 19-30, 32-35, 37 do not appear to contain any additional features which, in combination with the features of claims 1 and 31 to which they refer, meet the requirements with respect to inventive step, since they can be considered as mere alternatives without resulting in any unexpected effect whatsoever.

Section VI

3. WO2016131755

D2 has an earlier filing and priority date as the present invention, but is published after the filing date of the present application. It is important for novelty for the present claims. D2 (abstract) describes an electronic smoking device describing two detachable parts, one including a battery and a second part including the mouthpiece with an atomizer.

Section VII

4. Others

3.1 Two part form

Independent claims 1 and 31 are not in the two-part form in accordance with, which in the present case would be appropriate, with those features known in combination from the prior art being placed in the preamble and the remaining features being included in the characterising part.

3.2 Reference signs

The features of the claims should also be provided with reference signs in parentheses.