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**Datasheet for the decision
of 20 June 2023**

Case Number: T 0963/21 - 3.2.01

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A61M11/00

Language of the proceedings: EN

Title of invention:

AN AEROSOL-GENERATING SYSTEM HAVING A HEATER ASSEMBLY AND A
CARTRIDGE FOR AN AEROSOL-GENERATING SYSTEM HAVING A FLUID
PERMEABLE HEATER ASSEMBLY

Patent Proprietor:

Philip Morris Products S.A.

Opponent:

Nicoventures Trading Limited

Headword:

Relevant legal provisions:

EPC Art. 100(a), 54, 56, 100(b), 100(c)

Keyword:

Grounds for opposition - insufficiency of disclosure (no) -
added subject-matter (no)

Novelty - (yes)

Inventive step - could-would approach - (yes)

Decisions cited:

T 1374/07

Catchword:



Beschwerdekammern

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Case Number: T 0963/21 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 20 June 2023

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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
28 April 2021 concerning maintenance of the
European Patent No. 3104724 in amended form.**

Composition of the Board:

Chairman G. Pricolo
Members: M. Geisenhofer
S. Fernández de Córdoba

Summary of Facts and Submissions

- I. Appeals were filed by the patent proprietor and by the opponent against the interlocutory decision of the opposition division finding that, on the basis of the second auxiliary request (then on file), the patent in suit met the requirements of the EPC.
- II. The opposition division decided with regard to the **main request** (patent as granted) that
- (a) the subject-matter of this request was novel over documents

D4 US 2013/0213419 A1,
D5 WO 2010/045671 A1,
D6 US 2005/0268911 A1,
D7 WO 2013/013808 A1, and
D12 WO 2013/148810 A1, respectively.

In addition to documents D5 and D7, the following family members were used by the parties in their argumentation:

D5a US 2011/0226236 A1, and
D7a US 2014/0202454 A1.

- (b) The subject-matter of the main request was, however, not inventive over a combination of document

D1 US 2011/0309157 A1

with D4.

(c) The patent, on the basis of this request, disclosed the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art; and

(d) the subject-matter of the claims of this request did not extend beyond the content of the application as filed.

III. The opposition division further decided to admit late filed document

D22 CN 102861694 A
(with machine translation D22a)

into the proceedings, but did not admit document

D23 WO 2008/108889 A1.

Furthermore, the following document was considered to not form prior art:

D9 WO 2015/161459 A1.

IV. The following further documents were also referred to by the parties:

D2 DE 20 2013 100 606 U1, and
D3 US 2013/0087160 A1.

V. Oral proceedings were held before the Board.

(a) The appellant-patent proprietor requested that the decision under appeal be set aside and the patent be maintained as granted (main request), in the

alternative that the patent be maintained in amended form based on one of the auxiliary requests 2 (i.e. that the appeal of the opponent be dismissed), 3 to 8.

(b) The appellant-opponent requests that the decision under appeal be set aside and the patent be revoked.

VI. Independent claim 1 of the **main request** reads as follows:

*"A cartridge for use in an electrically operated aerosol-generating system, comprising:
a liquid storage portion (20) comprising a rigid housing (24) holding a liquid aerosol forming substrate, the housing having an opening; and
a fluid permeable heater assembly (30) comprising a plurality of electrically conductive filaments, wherein the filaments have a diameter between 8 μm and 100 μm , and
wherein the fluid permeable heater assembly is fixed to the housing and extends across the opening of the housing,
wherein the heater assembly (30) is substantially flat."*

Independent claim 14 of the main request reads as follows:

"An aerosol-generating system comprising a main unit (10) and a cartridge (20) according to any preceding claim, the cartridge being removably coupled to the main unit, wherein the main unit comprises a power supply (14)."

Independent claim 16 of the main request reads as follows:

*"A method of manufacture of a cartridge for use in an electrically operated aerosol generating system, comprising:
providing a liquid storage portion comprising a housing having an opening;
filling the liquid storage portion with liquid aerosol-forming substrate; and
fixing a substantially flat fluid permeable heater assembly comprising a plurality of electrically conductive filaments to the liquid storage portion, wherein the filaments have a diameter between 8 μm and 100 μm , and wherein the fluid permeable heater assembly extends across the opening of the housing of the liquid storage portion."*

VII. The appellant-opponent's arguments can be summarised as follows:

- (a) The range "*between 8 μm and 100 μm* " mentioned in claim 1 as granted lacked disclosure in the application as originally filed.
- (b) The specific combination of features according to granted dependent claims 5, 8, 9 and 11, and granted independent claims 14 and 16 lacked disclosure in the application as originally filed.
- (c) The skilled person was not able to carry out the invention since the imprecise expression "*substantially flat*" rendered it impossible to distinguish whether a heater assembly fell under the invention or not.

(d) The subject-matter of claim 1 was not novel over documents D4, D5/D5a, D6, D7/D7a, D9 and D12, respectively.

(e) The subject-matter of claim 1 was not inventive when starting from documents D1, D2, D3, D22 or D23, respectively, as closest prior art.

VIII. The appellant-patent proprietor's arguments can be summarised as follows:

(a) The description as originally filed disclosed on page 3 both end values of the range specified in claim 1 such that this range was disclosed.

(b) Granted claims 5, 8, 9 and 11 were based on originally filed claims 3, 9, 10 and 13. Granted claim 14 was based on a passage in the originally filed description on page 2, lines 31 - 33 and granted claim 16 was based on originally filed claim 27 completed by the same feature as added to claim 1.

(c) The term "*substantially flat*" lacked clarity if any. However, due to the explanations given in paragraph [0008], the skilled person knew how to understand the feature.

(d) None of documents D4, D5/D5a, D6, D7/D7a, D9 and D12 disclosed all features of claim 1.

(e) The subject-matter of claim 1 was not rendered obvious when starting from one of documents D1, D2, D3 and D22, respectively, as closest prior art.

(f) Document D23 was not admitted by the opposition division and the appellant-opponent did not provide reasons why this discretionary decision was not correct.

Reasons for the Decision

Main request

Amendments (Article 100(c) EPC)

1. The opposition division decided that granted claim 1 does not extend beyond the content of the application as filed.
- 1.1 The appellant-opponent argued that adding the range "*between 8 μm and 100 μm* " to the wording of claim 1 represents an unallowable amendment. The originally filed application only provides disclosure (see page 3, lines 18 - 20; repeated on page 14, lines 4 - 6) for either a first range of "*between 10 μm and 100 μm* " or a second range of "*between 8 μm and 50 μm* ". Since the ranges are not arranged in nesting relationship (i.e. the narrower range is entirely included within the wider range), these ranges have to be considered as being independent disclosures. It is hence not allowable to combine the lower end of the second range with the upper end of the first range.
- 1.2 The Board agrees that in the case of two independent passages containing each a list of alternative features, it might not be allowable to combine a feature from a first list with a feature of a second, independent list as set out e. g. in decision T1374/07 (see reasons 2.1) cited by the appellant-opponent.

- 1.3 In the present case, however, the two ranges are not different and independent disclosures in the application as filed at different, distant locations thereof and/or disclosures in a different context (e.g. the first range allowing for a first technical effect and the second range for a second technical effect).

The relevant passage in the application as filed reads:
"The electrically conductive filaments may have a diameter of between 10 μm and 100 μm , preferably between 8 μm and 50 μm , and more preferably between 8 μm and 39 μm ."

It is hence evident that all three ranges refer to the diameter of the filament (and to the diameter only, no other conditions being specified or even apparent) at different levels of preference albeit the ranges are not in nesting arrangement. Combining the upper limit of one range with the lower limit of the other range is therefore allowable (see also case law of the Boards of Appeal, 10th edition, II-E-1.5.1 a)).

- 1.4 Claim 1 was thus not unallowably amended.
2. The opposition division further decided that granted dependent claims 5, 8, 9, and 11 do not extend beyond the content of the application as filed.
- 2.1 The appellant-opponent argued that support for the features of these claims could only be found in the originally filed description. However, the description only provided support for the respective feature(s) mentioned in each claim as such but not for the combination of features resulting from the references of these claims to previous claims.

2.2 The Board notes that granted claims 5, 8, 9 and 11 correspond nearly literally to originally filed claims 3, 9, 10, 13. They only claim a cartridge instead of an aerosol-generating system comprising the cartridge.

It is, however, evident from the three aspects identified in the originally filed description (first aspect on page 1, lines 29 - 34; second aspect on page 13, lines 17 - 23; third aspect on page 15, line 34 - page 16, line 3) that the cartridge used within the aerosol-generating system can also be claimed as such, i.e. independently from the aerosol-generating system. The fact that the cartridge is self-supported and contains the liquid storage portion and the heater assembly is evident from a plurality of passages in the description as originally filed, see e.g. page 2, lines 31 - 33.

2.3 Albeit originally filed claim 1 (to which all four claims refer) was restricted to heaters with an area of the electrically conductive filament arrangement being less than or equal to 25 mm², this feature can be disregarded. As set out on page 3, lines 21 - 23, the restriction to less than or equal to 25 mm² is only a preferred feature.

2.4 Originally filed claims 3, 9, 10 and 13 together with the above-mentioned passages in the description therefore provide a basis for granted claims 5, 8, 9 and 11.

3. The opposition division finally held that granted claims 14 and 16 do not extend beyond the content of the application as filed either.

3.1 With regard to granted claim 14, the appellant-opponent again argued that the originally filed claims only provided disclosure for an aerosol-generating system having a heater with an area of less than or equal to 25mm².

As set out above with regard to the four dependent claims, the area of the heater is presented in the application as filed as an optional, preferred feature such that the information about the area of the heater can be omitted.

3.2 With regard to granted claim 16, the appellant-opponent argued with regard to the range "*between 8 μ m and 100 μ m*" in the same sense as to claim 1. Furthermore, they alleged that the term "*substantially flat*" lacked disclosure in the context of a method of manufacture. A substantially flat heater was only disclosed for the product as such.

3.3 Concerning the range, the arguments set out above with regard to claim 1 apply again. It is allowable to combine the upper end of the range with the lower end of the preferred range given on page 3 (corresponding to page 14) of the originally filed description.

3.4 Concerning the term "*substantially flat*", the Board notes that the application as originally filed does not provide a first disclosure for an aerosol-generating system and/or a cartridge used within that system on one hand, and for an isolated, second disclosure of a method of manufacture completely independent therefrom on the other hand. In fact, the description as originally filed explicitly explains on page 16 in lines 9 - 11 that features described in relation to one aspect may equally be applied to other aspects of the

invention. Since the method of manufacture is the "third aspect" presented in the application as originally filed, it is allowable to combine features from the system and/or the cartridge with the method of manufacture.

3.5 Claims 14 and 16 were hence not unallowably amended either.

4. The Board therefore sees no reason to deviate from the decision of the opposition division with regard to Article 100(c) EPC.

Sufficiency of disclosure (Article 100(b) EPC)

5. The opposition division held that the patent discloses the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

5.1 The appellant-opponent argued that the term "*substantially flat*" used in the granted claims is so ambiguous that the skilled person was unable to identify without undue burden the technical measures necessary for putting in practice the claimed subject-matter.

5.2 The Board disagrees and fully shares the reasons given by the opposition division in points 21.1 and 21.2 of their decision: the patent provides sufficient information in paragraph [0008] in lines 11 - 31 of what must be understood with "*substantially flat*".

Novelty (Article 54 EPC)

6. The opposition division held that the subject-matter of claim 1 is novel over D4, D5 (being equivalent to family member D5a), D6, D7 (being equivalent to family member D7a), D9 and D12, respectively.

The appellant-opponent disagreed and argued that the subject-matter of claim 1 lacked novelty over each of these documents.

7. **Document D4** discloses in figure 4 an electrically operated aerosol-generating system with a cartridge (70). The cartridge comprises a liquid storage portion (22) comprising a rigid housing holding a liquid aerosol forming substrate (9), and a fluid permeable heater assembly (14) comprising a plurality of electrically conductive filaments (see paragraph [0029]: ribbon (14) is a wire mesh). The filaments have a diameter of 0,0014 to 0,0016 inch (i. e. 35,56 to 40,64 μm), which is within the range between 8 μm and 100 μm .

As can be seen in figure 10, the housing has an opening in the wall (62) through which a wick (28) extends. The heater assembly is wound around the wick such that the heater assembly is fixed via the wick to the housing.

- 7.1 The appellant-opponent argued that the housing had a (further) opening corresponding to the central channel that extends through the housing and through which air is drawn by the user of the cigarette. The fluid permeable heater assembly (14) extended across that opening of the housing. Furthermore, heater assembly (14) was substantially flat as set out in paragraph [0030] ("planar metal ribbon").

7.2 In the Board's view it must be distinguished between a heater assembly being substantially flat (as required by claim 1) and a heater assembly comprising a ribbon which itself is substantially flat, but is bent in three dimensions to form a helix, as disclosed in D4. The heater assembly of D4 consists namely of a ribbon that is wound around the wick such that the heater assembly is a three-dimensional structure and is not, therefore, substantially flat. This reading is moreover in accordance with the definition of the expression "*substantially flat*" given in paragraph [0008] of the patent.

It is irrelevant whether the ribbon has a cross section with a width being significant larger than the height such that it is planar before being wound around the wick. The resulting heater assembly is, independently from the cross-section of the ribbon, a three-dimensional structure.

7.3 The subject-matter of claim 1 hence differs from the cartridge known from D4 in that the heater assembly is substantially flat, D4 therefore not anticipating the subject-matter of claim 1.

8. **Document D5** (and family member D5a) discloses in figure 9 a cartridge (3) for use in an electrically operated aerosol-generating system. The cartridge comprises a liquid storage portion (4) having a rigid housing (4) holding a liquid aerosol forming substrate (16). The housing has an opening through which liquid is conveyed via capillary action to a heater assembly (22).

Table 1 in paragraph [0123] discloses an exemplary composition of the heater assembly: a metal foil is

covered with three wire mesh layers, the wires having a diameter of 36, 30 and 20 μm , respectively. The heater assembly thus comprises a plurality of electrically conductive filaments having a diameter in the range between 8 μm and 100 μm and is substantially flat.

8.1 It is, however, disputed whether the heater assembly extends across the opening of the housing.

8.2 In a first line of argument, the appellant-opponent argued that opening (55) shown in figure 20 could be considered as an opening of the housing holding the liquid substrate.

The housing holding the liquid substrate (denominated "*liquid container*" in D5a), however, ends with the openable closure (18) which is pushed open when the housing (4) is plugged in. Opening (55) is not part of the liquid container but part of a buffer store as set out in paragraph [0139].

8.3 The appellant-opponent then argued in a second line of argument that the slots (53) for buffering liquid substrate (detail C shown in figures 17 and 20) could also be understood as a liquid storage portion with a housing having an opening whereby the heater assembly (22) extended across the opening of this slot/housing.

In the board's understanding, a slot in a solid body is not a housing. A housing requires walls enclosing a void which are not present in figures 17 and 20, such that the buffering slots of D4 cannot form a plurality of housings.

8.4 In an alternative third line of argument, the appellant-opponent argued that the slots (53) together with the liquid container (4) form the storage portion.

This is not convincing either since the combination of liquid container and slots is a body of very irregular shape and comprises a plurality of different components such that the skilled person would not recognize it as one single housing.

8.5 But even if one would consider the walls of slots (53) as the walls of a housing or the slots forming part of the housing, heater assembly (22) is neither fixed to the housing (but to the opposed wall of the capillary gap (41) into which the slots lead) nor does it extend across the opening of the slots (but is arranged vis-a-vis the opening).

8.6 The subject-matter of claim 1 is thus also novel over D5/D5a.

9. **Document D6** discloses in figure 3 an electrically operated aerosol-generating system. The substrate is, however, neither liquid nor is there provided a liquid storage portion with a rigid housing holding the liquid substrate.

9.1 The appellant-opponent argued that according to paragraph [0069] of D6 the substrate was liquid when applied to the support (78). The shells (52, 54) enfolding the support with substrate hence could be considered as forming a housing for holding the liquid substrate.

9.2 The board disagrees since the substrate used in D6 is only applied during manufacture in liquid state but

then dries. The device - when ready for use - hence lacks a liquid substrate.

9.3 Due to the absence of a liquid substrate, D6 cannot comprise a storage portion holding such a liquid aerosol-forming substrate. The shells are not holding a liquid aerosol-forming substrate as required by claim 1 but enfold the entire device including electric circuits etc. such that the shells form a general casing of the device and not a liquid storage portion comprising a housing holding a liquid.

9.4 Unless there is a housing holding a liquid, the heater assembly of D6 cannot be fixed to such a housing and cannot extend across an opening thereof.

9.5 The subject-matter of claim 1 hence is also novel over D6.

10. **Document D7** (and family member D7a) discloses in figure 8 a cartridge for use in an electrically operated aerosol-generating system. The cartridge comprises a liquid storage portion comprising a rigid housing (19) holding a liquid aerosol forming substrate (18). As can be seen in figure 9, the housing has an opening (20) through which liquid substrate is drawn by capillary action via channel (16) onto heater assembly (10).

10.1 The appellant-opponent argued that opening (22) formed by the circuit board (11) and wall (23) can also be considered as the opening of the housing since both openings are adjacent and together performed the function of enabling passage from one zone of the device to another.

10.2 However, opening (22) is not an opening of the housing holding the liquid substrate. As set out in paragraph [0040] of D7a, the liquid container (19) comprises two openings: the supply opening (20) and the vent opening (21). Opening (22) is not mentioned.

This is in line with the board's understanding of the term "*opening of housing*": an opening is an aperture in the wall of the housing and not an aperture offset from the housing whereby the distance between housing and aperture needs to be bridged by an additional channel or further member of the device.

10.3 Even if one would consider opening (22) to be the opening of the housing, heater assembly (10) would not extend across the opening of the housing but rather be arranged in alignment with the channel (16) leading to the opening (22).

10.4 Hence the subject-matter of claim 1 is novel over D7/D7a in any case.

11. **Document D9** is not prior art for the patent in suit, this document being an international application filed on 23 April 2014 and published on 20 October 2015, both dates being later than the priority date of the patent in suit (10 February 2014).

The appellant-opponent's objection that the patent was not entitled to priority was based on the same reasons as the non-compliance of the granted claims with the requirements of Article 123(2) EPC (the application as filed essentially corresponding to the priority document). As there is no added subject-matter, as explained above, also the objection that the priority

claim is invalid fails, as acknowledged by the appellant-opponent at the oral proceedings.

12. **Document D12** discloses in figure 3 a cartridge (90) for use in an electrically operated aerosol-generating system. The cartridge contains a solid substrate (150) on a carrier (250) that at the time is a heater assembly.

12.1 In the absence of a liquid substrate, D12 can neither disclose a liquid storage portion with a rigid housing having an opening, nor a heater assembly being fixed to that housing and extending across the opening.

12.2 The subject-matter of claim 1 is thus also novel over D12.

13. The board hence has no reason to deviate from the opposition division's decision with regard to novelty.

Inventive step (Article 56 EPC)

14. The opposition division held that the subject-matter of claim 1 was not inventive over a combination of **document D1 as closest prior art** with the teaching of D4.

14.1 The appellant-patent proprietor disagreed and argued essentially that the opposition division misinterpreted D1.

14.2 Document D1 discloses in figure 2 an electrically operated aerosol-generating device.

14.2.1 The device comprises a liquid storage portion comprising a rigid housing holding a capillary tube (1) concentrically surrounded by two layers of wicking material (2, 3) and two liquid aerosol forming substrates (liquids 5, 6).

Contrary to the appellant-patent proprietor's view, a housing surrounding the liquid substrates is necessarily present in order to delimit the storage portion from the electronic parts (e.g. control circuit 9) of the device.

14.2.2 The housing has at its upper end an opening since otherwise liquid substrate contained in the housing could not be volatilized and the formed aerosol transferred to the mouthpiece (8).

14.2.3 The device further comprises a heater assembly (7) comprising a plurality of electrically conductive filaments (see paragraph [0019]: "wire mesh heater"), wherein the heater assembly extends across the opening of the housing. Since the heater assembly must be mounted somewhere and is only in contact with the upper face of the liquid storage portion, it must also be implicitly fixed to the housing.

14.2.4 Since the heater assembly covers the capillary tube (1) and the two layers of wicking materials (2, 3), aerosol produced from the substrate must be able to pass from the storage portion to the mouthpiece (8), i. e. the heater assembly must be fluid permeable (n. b. a fluid might be in liquid state or in gaseous state).

14.3 It is undisputed that D1 does not contain information on the diameter of the filaments, i. e. D1 does not

disclose that the filaments have a diameter between 8 μm and 100 μm .

- 14.4 It was however disputed whether the device shown in figure 2 of D1 is a cartridge for use in an electrically operated aerosol-generating system.
- 14.4.1 The opposition division held that "what is disclosed in figure 2 of D1 can certainly be seen as a cartridge" (see reasons 29.5) without giving any reasons for this conclusion.
- 14.4.2 The appellant-patent proprietor submitted that a cartridge was a removable component used in a larger piece of equipment. Since D1 does not disclose such a larger piece of equipment, the device of figure 2 cannot be a cartridge.
- 14.4.3 The appellant-opponent argued that the device shown in figure 2 was not provided with a battery but that an external battery was connected to the circuit board (see paragraph [0019]). The device shown in figure 2 needed hence be combined with at least one further piece of equipment in order to form the aerosol-generating system, and hence may be considered as a cartridge.
- 14.4.4 The board agrees that an external battery (e. g. battery (130) shown in figure 3) can constitute a further piece of the aerosol-generating system. The term "cartridge" used in the technical filed of electronic cigarettes, however, usually designates a throw-away part of the aerosol-generating system containing expandable material whereby the used cartridge can be replaced by a new, identical cartridge. When coupling the device of figure 2 with an

external, exchangeable battery, the piece containing the exchangeable battery - if any - can be considered as a cartridge, but not the device which is the permanently used piece of the combination. The device shown in figure 2 is hence not a cartridge in the usual understanding of the expression in the technical field of electronic cigarettes.

14.5 It was further disputed whether the heater assembly (7) shown in figure 2 is substantially flat.

14.5.1 The appellant-patent proprietor argued that figure 2 shows just a cut through the device such that it is not excluded that the heater assembly has a three-dimensional geometry.

14.5.2 The board is not convinced by this argument since, as pointed out by the opposition division, a mesh as disclosed in [0019] of D1 is (normally) flat and moreover, if the heater assembly of figure 2 would be of an irregular geometry, the parts of the heater assembly extending above the cut visible in figure 2 must be represented as parts behind the plane in which the heater assembly is cut. Figure 2, however, shows just the cut section of the heater element such that the board is convinced that the heater element is indeed disk-shaped with two parallel surfaces, i. e. substantially flat in the definition of the patent.

14.6 With regard to the above disputed features, both appellants elaborated on a plurality of different passages of the description of D1.

14.6.1 The appellant-opponent requested to not admit arguments based on passages that were not previously cited in the appellant-patent proprietor's grounds of appeal and the

appellant-patent proprietor's reply to the appellant-opponent's grounds (Article 13(2) RPBA 2020).

14.6.2 The above conclusions on the disclosure of D1 are however based on the arguments presented in writing by the appellant-patent proprietor before the summons were issued. The admission of arguments of the appellant-patent proprietor based on passages not relied upon in writing can therefore be left unanswered.

14.7 Hence, the subject-matter of claim 1 differs from the device known from D1 in that

- (a) the device is a cartridge for use in an electrically operated aerosol-generating system; and
- (b) the filaments of the heater assembly have a diameter between 8 μm and 100 μm .

14.8 The appellant-opponent argued that use of cartridges is notorious knowledge in the field of electronic cigarettes such that feature (a) cannot be considered to be inventive.

The use of filaments having a diameter between 8 μm and 100 μm is not described to have a technical effect over the prior art and hence is an unmotivated choice, which is at least rendered obvious by D4.

14.8.1 Even if a particular feature does not *per se* provide a technical effect over the prior art and thus the objective technical problem is to be seen in the provision of a mere alternative, still it has to be assessed whether it was obvious for the skilled person to modify the device of D1 by implementing features (a) and (b).

14.8.2 The heater assembly of D4 consists (see paragraph [0034]) of a ribbon made of a wire mesh using wires with a diameter of 0,0014 to 0,0016 inch (35,56 to 40,64 μm) which is within the range mentioned in claim 1.

14.8.3 It is however not evident that the wire mesh used for the ribbon in D4 can indeed be used to build the wire mesh heater assembly mentioned in paragraph [0019] of D1.

(a) The heater of D1 is a flat heater assembly extending in two directions such that it is in plane contact with the upper face of the liquid storage portion.

The ribbon of D4 on the contrary is a longitudinal heater wire intended to be wound around a wick.

(b) The electric circuit controlling the heater assembly must fit the electrical properties of the wire mesh. This requires that the resistance of the wire mesh, but also its dimensions must fit the power supply such that the wire mesh becomes sufficiently hot but does not burn.

(c) The appellant-opponent's allegation that the diameter would have no technical effect hence cannot be followed. On the contrary, it is not apparent that the wire mesh used for the ribbon of D4 could indeed be used for the heater assembly of D1, nor has the appellant-opponent explained why this would be the case.

14.8.4 The board therefore is not convinced that the skilled person would exchange the wire mesh of the heater

assembly of D1 with the wire mesh used for the ribbon of D4 without further modifications.

- 14.8.5 In fact, the appellant-opponent failed to provide a reason why the skilled person not only could but indeed would use the ribbon of D4 to build the heater assembly of D1. Choosing a particular diameter for the filaments is not an arbitrary choice but the diameter of the filaments must intentionally be chosen such that the mesh has the desired heating effect.
- 14.9 The Board therefore does not agree with the opposition division's conclusion that the skilled person would consider replacing the wire mesh of the heater assembly of D1 by the wire mesh of the ribbon of D4. For this reason alone, the subject-matter of claim 1 is not rendered obvious when starting from document D1.
- 14.10 The appellant-opponent further argued that the skilled person would replace the heater assembly of D1 by one of the heater assemblies of D2, D3, D5, D7 or D22/D22a.
- 14.10.1 It is, however, not evident that the heaters of D2, D3, D5, D7 or D22/D22a, respectively, could replace the heater assembly of D1.

The heater assembly of D2 (see figure 3) uses a wire arranged in a zig-zag pattern with only few filaments.

D3 and D22/D22a disclose heaters with a single, meandering heating element printed onto an isolating board (see figure 14 of D3 and figure 2 of D22/D22a).

D5 and D7 disclose heaters using a metal foil covered by three layers of metal mesh.

These heaters use different principles compared to D1 to evaporate the liquid substrate such that it is not evident that the skilled person only needs to replace the heater assembly without further modification.

14.10.2 But even assuming that the skilled person could use one of these prior art heater assemblies, the board cannot see - similarly to the arguments with regard to the combination of D1 with D4 - any reason why the skilled person would replace the existing heater of D1 by a heater assembly of a different type.

14.11 The appellant-opponent finally argued that D6 and D12 would both render distinguishing feature (b) obvious.

As set out above with regard to novelty, D6 and D12 do not disclose a liquid substrate but evaporate solid substrate on a support. The skilled person would not consider a heater for a solid substrate when looking for a suitable replacement for a heater evaporating a liquid substrate.

14.12 It hence can be left aside whether the skilled person would redesign the device with external battery such that it comprises a cartridge with housing and a heater assembly attached thereto according distinguishing feature (a).

15. In a second line of argument with regard to inventive step, the appellant-opponent argued starting from **document D22 as closest prior art.**

15.1 The appellant-patent proprietor alleged that this line of argument was only raised during oral proceedings before the board and hence should not be admitted pursuant to Article 13(2) RPBA 2020.

- 15.1.1 The appellant-opponent elaborated on inventive step starting from document D22 on page 35 of their grounds of appeal (points 193 - 205). They alleged that the particular range for the filament's diameter would be rendered obvious by D4, D5, D7 and D20 - but these arguments were raised with reference to the auxiliary request maintained by the opposition division.
- 15.1.2 However, the appellant-opponent also stated in the very same letter at point 120 on page 21 that "*the inventive step arguments presented below for AR1 apply mutatis mutandis to the granted claims*".
- 15.1.3 The line of argument starting from document D22 was hence not raised (and/or substantiated) during oral proceedings for the first time but this line of argument stems from the appellant-opponent's grounds of appeal such that the provisions of Article 13(2) RPBA 2020 do not prejudice admitting this line of argument.
- 15.2 Document D22 (and the machine translation D22a) was admitted by the opposition division into the proceedings and discloses a cartridge for use in an electrically operated aerosol-generating system, the cartridge comprising:
- a liquid storage portion comprising a rigid housing (2) holding a liquid aerosol forming substrate (6), the housing having an opening (at the upper end of the cartridge); and
 - a fluid permeable heater assembly (see paragraph [0025] of D22a: heating wire (1) fixed to glass fiber board (4)).

The fluid permeable heater assembly is fixed to the housing (see paragraph [0031]) and extends across the

opening of the housing. The heater assembly is substantially flat (see paragraphs [0025] and [0032]: glass fibre board is disk-shaped and heating wire is produced by etching on the board).

- 15.3 The subject-matter of claim 1 differs from the cartridge known from D22/D22a in that
- (a) the heater assembly comprises a plurality of electrically conductive filaments, and
 - (b) the filaments have a diameter between 8 μm and 100 μm .

This is undisputed between the parties.

- 15.4 The appellant-opponent argued again that no technical advantage can be achieved by the particular choice for the filaments' diameter.

- 15.4.1 However, as set out above, the choice of the diameter is not arbitrary.

- 15.4.2 The technical problem is therefore to provide an alternative to the heater assembly of D22/D22a.

- 15.5 In the appellant-opponent's view, documents D4, D5 and D20 would render a heater assembly with a plurality of filaments having a diameter falling within the range of distinguishing feature (b) obvious.

- 15.5.1 Document D4 discloses (as discussed above in the first line of argument under inventive step) a heater assembly consisting of a ribbon made of a wire mesh, the wires having a diameter of 0,0014 to 0,0016 inch. The ribbon is wound around a wick.

Document D5 discloses (as discussed above with regard to novelty) a heater assembly consisting of a metal foil covered with three layers of wires, the wires having a diameter of 36, 30 and 20 μm , respectively.

Document D7 stems from the same inventors and again discloses a heater assembly similar to D5.

- 15.5.2 Following the same reasoning as set out above with regard to the first line of argument, it is questionable whether the heater assemblies known from D4, D5 or D7, respectively, would obviously be assumed to be suitable for replacing the heater assembly of D22/D22a.

Documents D4, D5 and D7 disclose entirely different types of heater assemblies: D4 uses a ribbon wound around a wick, whereas D5 and D7 use a two-dimensional metal foil covered with several layers of wire mesh. These different heater types cannot be simply used to replace the meandering heating wire on a glass fibre board used in D22/D22a. On the contrary, significant changes of the device are needed to allow producing aerosol in the desired rate and amount.

- 15.5.3 In any case the question of whether the skilled person would replace the heater assembly of D22/D22a by one of the prior art heater assemblies still remains.

Document D22a, explains in paragraph [0005] - [0007] that - starting from prior art heaters with a plurality of thin filaments - the inventors of D22 improved the heater by using one single wire arranged meandering on a support (paragraph [0010]).

Replacing the improved heater assembly having a single wire again with a heater assembly having a plurality of thin filaments hence would be a step back in development. As the opposition correctly held, the skilled person would not consider such a step back.

15.5.4 The skilled person would hence not consider to replace the heater assembly of D22/D22a by one of the heater assemblies of D4, D5 or D7, respectively.

15.6 Document D20 is a brochure of Kynol Europa GmbH advertising one of their products: activated carbon fibers used to produce fabrics for e. g. filters.

However, D20 does not disclose use of the fibres for a heater assembly and is therefore irrelevant for the question whether the skilled person would replace the heater assembly of D22/D22a.

15.7 The appellant-opponent further argued that the skilled person would at least consider replacing the meandering wire of D22/D22a by a wire mesh as used in the ribbon of D4. This would allow for use of a wire with increased resistance, thus minimizing energy consumption of the heater assembly.

15.7.1 D22a indeed sets out in paragraph [0009] that its heater uses a "*high-resistance heating wire*" which resistance is according to paragraph [0034] significant higher "*than the 3.0 ohm spiral heating wire commonly used in industry at present*". This increase in resistance would require less energy for heating the wire.

15.7.2 The ribbon used in D4, however, has a resistance of 0,3 to about 10 Ohms, preferably about 4,0 Ohms or less

(see paragraph [0035]) such that there is no significant increase of resistance compared to the prior art heaters mentioned in D22/D22a. Replacing the wire of D22/D22a by the ribbon of D4 hence would not significantly change the energy consumption of the prior art heater assembly such that again, the skilled person would not consider the heater of D4 as it does not provide an advantage over the existing heaters.

15.7.3 Furthermore, the wire of D22/D22a is applied by etching to the glass fibre board (see paragraph [0032]) whereas the wire mesh ribbon of D4 is produced separately and then wound around the wick. A wire mesh, however, cannot be bonded to the glass fibre board of D22/D22a prior to mounting the glass fibre board by pressing onto the heat resistant cotton (5) during manufacture.

15.7.4 The skilled person therefore would not consider exchanging the wire of D22/D22a by the ribbon of D4 either.

16. In a third line of argument with regard to inventive step, the appellant-opponent argued starting from **document D2 as closest prior art.**

16.1 The appellant-patent proprietor alleged again that this line of argument was raised during oral proceedings before the board for the first time, and hence should not be admitted under Article 13(2) RPBA 2020.

16.1.1 The appellant-opponent raised this line of argument when discussing inventive step of the auxiliary request in their grounds of appeal starting on page 38 (points 210 - 226).

16.1.2 For the same reasons provided above with regard to the second line of argument, the board does not follow the appellant-patent proprietor's view but considers this line of argument being already raised in the appellant-opponent's grounds of appeal. Article 13(2) RPBA 2020 thus does not prejudice admitting this line of argument.

16.2 Document D2 discloses in figure 2 a cartridge (4) for use in an electrically operated aerosol-generating system (shown in figure 1), comprising:

- a liquid storage portion (5) comprising a rigid housing holding a liquid aerosol forming substrate, the housing having an opening (5a); and
- a fluid permeable heater assembly (shown in figure 3).

The fluid permeable heater assembly is fixed to the housing and extends across the opening of the housing. The heater assembly is substantially flat.

16.3 It is disputed between the parties whether the heater assembly of D2 comprises a plurality of electrically conductive filaments or just one filament arranged in M-shape.

16.3.1 The appellant-patent proprietor argued that [0043] of D2 refers to a heating element (7) that "consists of a heating wire" in singular, i. e. that one single wire is arranged in a zig-zag pattern.

The appellant-opponent pointed to paragraph [0030] that refers to "heating wires" in plural, however in the context of "heating wires are ... used as heating elements".

- 16.3.2 In the board's view, a single wire arranged in zig-zag pattern between several terminals may be regarded as providing a plurality of filaments such that D2 discloses a heating element with a plurality of filaments independently from the question whether one single wire is used or a plurality of separate wires.
- 16.4 D2 therefore only lacks disclosure of the diameter of the filaments being between 8 μm and 100 μm , which is undisputed.
- 16.5 The appellant-opponent argued in analogy to the above-mentioned second line of argument: the particular choice would not provide a particular technical effect and hence must be considered as a routine workshop modification. Document D4, D5, D7 and D20 would render it obvious to use a diameter of the filaments which falls within the range given in claim 1.
- 16.5.1 Following the argumentation with regard to the second line or argument on inventive step, it is already questionable whether the skilled person would use a wire mesh of filaments having a diameter falling within the range given in claim 1.
- 16.5.2 In any way, there is no convincing reason why the skilled person would carry out a modification where, instead of only few wires as in D2, the wire meshes known from D4, D5 or D7 are used. The same applies to D20 that even lacks disclosure of a wire mesh being used for a heater assembly.
- 16.5.3 The subject-matter of claim 1 is thus also not obvious starting from D2 as closest prior art.

17. In a fourth line of argument with regard to inventive step, the appellant-opponent argued starting from **document D3 as closest prior art.**

17.1 Document D3 discloses a cartridge for use in an electrically operated aerosol-generating system. The cartridge comprises a liquid storage portion (20) with a rigid housing holding a liquid aerosol forming substrate, the housing having an opening. The cartridge further comprises a fluid permeable heater assembly (26) with a meandering heating wire.

The fluid permeable heater assembly is fixed to the housing and extends across the opening of the housing, wherein the heater assembly (30) is substantially flat.

17.2 The subject-matter of claim 1 differs from the cartridge known from D3 in that
(a) the heater assembly comprises a plurality of electrically conductive filaments, and
(b) the filaments have a diameter between 8 μm and 100 μm .

This is undisputed between the parties.

17.3 The appellant-opponent argued that D5 and D7 would render both distinguishing features obvious.

17.3.1 As set out above, D5 and D7 both use a similar heater assembly consisting of a metal foil covered by three different layers of wire mesh.

This is again a significantly different type of heater assembly compared to D3 such that it is not evident that the heater assembly of D3 can even be replaced by

the heater assembly of D5 and D7 without further modification of the cartridge.

- 17.3.2 Even if the heater assembly of D5 and D7 could be a suitable replacement, it is still not apparent why the skilled person would replace the heater assembly of D3 by the heater assembly of D5 and D7. As set out above, the choice of a particular diameter is not an arbitrary choice but must comply with the given constraints.
18. In a fifth line of argument, the appellant-opponent argued starting from **document D23 as closest prior art**.
- 18.1 Document D23 was filed after expiry of the opposition period. The opposition division decided that this document is *prima facie* not more relevant than the other documents on file and did not admit it (reasons, point 36).
- 18.2 The appellant-opponent argued that the opposition division did not correctly exercise their discretion since they judged on whether the document is more relevant than the remaining prior art on file, instead of judging on whether the document is relevant for the outcome of the case.
- 18.3 The board does not see a decisive difference. If none of the documents on file would prejudice the request under discussion, a further document not more relevant than the documents already on file would not change the outcome of the procedure either. Otherwise it would be more relevant than the prior art on file.
- 18.4 The board cannot therefore recognize an error committed by the opposition division when exercising their discretion.

18.5 D23 not being in the proceedings, any argument based on D23 is moot.

19. With regard to further independent claim 14 and 16, the appellant-opponent referred to their arguments on claim 1 (see page 43 of their grounds of appeal, point 245).

Since the arguments raised with regard to claim 1 are not convincing, they cannot prejudice the patentability of claim 14 and/or claim 16 either.

20. No further lines of attack were raised by the appellant-opponent.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The patent is maintained as granted.

The Registrar:

The Chairman:



A. Voyé

G. Pricolo

Decision electronically authenticated