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**Datasheet for the decision
of 22 January 2025**

Case Number: T 0379/23 - 3.2.02

Application Number: 17727924.7

Publication Number: 3471807

IPC: A61M15/06, A24F47/00, A61M11/04

Language of the proceedings: EN

Title of invention:

VAPORISER ASSEMBLY FOR AN AEROSOL-GENERATING SYSTEM

Patent Proprietor:

Philip Morris Products S.A.

Opponent:

Nicoventures Trading Limited

Relevant legal provisions:

EPC Art. 54, 56, 83, 84, 111(1), 123(2)
RPBA 2020 Art. 11, 12(2), 12(4), 13(1)

Keyword:

Amendments - extension beyond the content of the application
as filed
Sufficiency of disclosure
Claims - clarity
Novelty
Inventive step
Submissions made after notification of Art. 15(1) RPBA
communication - taken into account (yes)
Amendment after notification of Art. 15(1) RPBA communication
(no)

Decisions cited:

G 0003/89, G 0003/14, T 1621/16, T 1937/17, T 2790/18,
T 0795/21, T 1261/21, T 1408/21, T 1766/22, T 1824/22,
T 0579/23



Beschwerdekammern

Boards of Appeal

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Case Number: T 0379/23 - 3.2.02

D E C I S I O N
of Technical Board of Appeal 3.2.02
of 22 January 2025

Appellant: Nicoventures Trading Limited
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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 22 December
2022 rejecting the opposition filed against
European patent No. 3471807 pursuant to Article
101(2) EPC.**

Composition of the Board:

Chairman M. Alvazzi Delfrate
Members: S. Dennler
C. Schmidt

Summary of Facts and Submissions

I. The opponent filed an appeal against the decision of the opposition division to reject its opposition to the contested patent.

II. In its decision, the opposition division found that the invention of the patent as granted was sufficiently disclosed, that independent claims 1 and 12 as granted did not contain added subject-matter, and that their subject-matter was novel and inventive, in particular in view of the following documents:

D1 WO 2015/117705 A2

D2 US 2007/107879 A1

D3 CN 105394816 A

D3a Machine translation of D3 into English

D6 GB 2504076 A

III. The **appellant (opponent)** requested that the decision under appeal be set aside and that the contested patent be revoked.

The **respondent (patent proprietor)** requested that the appeal be dismissed, i.e. that the patent be maintained as granted (main request), or , alternatively, that the patent be maintained as amended on the basis of the claims of one of the auxiliary requests I to VI filed with the reply to the statement of grounds of appeal or auxiliary request VII filed with the respondent's letter dated 2 February 2024.

IV. Oral proceedings were held before the Board on 22 January 2025, at the end of which the present decision was announced.

V. The independent claims of the **main request**, claims 1 and 12 as granted, read as follows (with the feature numbering used in the decision under appeal):

Claim 1

- 1a** "Vaporiser assembly for an aerosol-generating system, comprising:
- 1b** a capillary element (2) made from porous glass, the capillary element (2) having a first end (4) and a second end (6); and
- 1c** a heater element (8),
- 1d** wherein the first end of the capillary element (4) is configured to be fluidly connected to a liquid storage portion (10),
- 1e** wherein the heater element (8) is provided at the second end of the capillary element (6), and
- 1f** wherein the pore size of the capillary element (2) is configured to allow a liquid aerosol-forming substrate (14) from the liquid storage portion (10) to be conveyed from the first end of the capillary element (4) to the second end of the capillary element (6) by capillary action,
- 1g** wherein the average pore size of the capillary element (2) varies from large pores (12) at the first end of the capillary element (4) to small pores (16) at the second end of the capillary element (6) such that a pore size gradient from the first end of the capillary element (4) to the second end of the capillary element (6) is provided,
- 1h** wherein the average pore size of the small pores (16) is between 2 and 8 microns, and

- 1i** *wherein the average pore size of the large pores (12) is between 5 and 500 microns."*

Claim 12

- 12a** *"Method for manufacturing a vaporiser assembly for an aerosol-generating system, comprising:*
- 12b** *providing a capillary element (2) made from porous glass, the capillary element (2) having a first end (4) and a second end (6); and*
- 12c** *providing a heater element (8),*
- 12d** *wherein the first end of the capillary element (4) is configured to be fluidly connected to a liquid storage portion (10),*
- 12e** *wherein the heater element (8) is provided at the second end of the capillary element (6), and*
- 12f** *wherein the pore size of the capillary element (2) is provided to allow a liquid aerosol-forming substrate (14) from the liquid storage portion (10) to be conveyed from the first end of the capillary element (4) to the second end of the capillary element (6) by capillary action,*
- 12g** *wherein the average pore size of the capillary element (2) varies from large pores (12) at the first end of the capillary element (4) to small pores (16) at the second end of the capillary element (6) such that a pore size gradient from the first end of the capillary element (4) to the second end of the capillary element (6) is provided,*
- 12h** *wherein the average pore size of the small pores (16) is between 2 and 8 microns, and*
- 12i** *wherein the average pore size of the large pores (12) is between 5 and 500 microns."*

- VI. Claims 1 and 12 of **auxiliary request I** are identical to those of the main request except that features 1e and 12e are amended as follows (amendments highlighted by the Board):

"wherein the heater element (8) is provided at the second end of the capillary element (6), and directly in contact with the second end of the capillary element (6), and"

- VII. Claims 1 and 12 of **auxiliary request II** are identical to those of the main request except for the following additional feature appended to the claims:

"and wherein the vaporiser assembly further comprises a fluid impermeable coating applied to the outer surface of the capillary element."

- VIII. Claims 1 and 11 of **auxiliary request III** are identical to claims 1 and 12 of the main request except for the following additional feature appended to the claims:

"and wherein the heater element (8) is provided as a metallic coating."

- IX. Claims 1 and 12 of **auxiliary request IV** are identical to those of the main request except for the following additional feature appended to the claims:

"and wherein the porous glass has an internal structure which allows liquids to be conveyed from the first end of the capillary element (2) to the second end of the capillary element (2), the porous glass comprising pores which enable liquid to travel through the capillary element (2)."

- X. Claims 1 and 12 of **auxiliary request V** are identical to those of the main request except that features 1b and 12b are amended as follows:

"[...] a capillary element (2) entirely made from porous glass, [...]"

- XI. The sole independent claim of **auxiliary request VI**, claim 1, reads as follows (with amendments to claim 1 as granted highlighted by the Board):

"An aerosol-generating system comprising:
a main body, the main body comprising a housing, a power supply, electric circuitry, and a vaporiser assembly, and
a replaceable liquid storage portion (10), detachably connectable to the main body (18), wherein the first end of the capillary element (4) of the vaporiser assembly is inserted into the liquid storage portion (10) when the liquid storage portion (10) is attached to the main body (18), such that the capillary element (2) comes into fluid communication with the liquid aerosol-forming substrate (14) stored in the liquid storage portion (10),
the ~~vaporiser assembly for an aerosol-generating system,~~ comprising:
a capillary element (2) made from porous glass, the capillary element (2) having a first end (4) and a second end (6); and
a heater element (8),
wherein the first end of the capillary element (4) is configured to be fluidly connected to a the liquid storage portion (10),
wherein the heater element (8) is provided at the second end of the capillary element (6), and

wherein the pore size of the capillary element (2) is configured to allow a liquid aerosol-forming substrate (14) from the liquid storage portion (10) to be conveyed from the first end of the capillary element (4) to the second end of the capillary element (6) by capillary action,
wherein the average pore size of the capillary element (2) varies from large pores (12) at the first end of the capillary element (4) to small pores (16) at the second end of the capillary element (6) such that a pore size gradient from the first end of the capillary element (4) to the second end of the capillary element (6) is provided, wherein the average pore size of the small pores (16) is between 2 and 8 microns, and wherein the average pore size of the large pores (12) is between 5 and 500 microns."

XII. The sole independent claim of **auxiliary request VII**, claim 1, reads as follows (with amendments to claim 1 as granted highlighted by the Board):

"An aerosol-generating system, comprising:
a main body (18), the main body (18) comprising a housing, a power supply, electric circuitry and a vaporiser assembly, the v~~Vaporiser assembly for an aerosol generating system,~~ comprising:
a capillary element (2) made from porous glass, the capillary element (2) having a first end (4) and a second end (6); and
a heater element (8),
wherein the first end of the capillary element (4) is configured to be fluidly connected to a liquid storage portion (10),
wherein the heater element (8) is provided at the second end of the capillary element (6), and

wherein the pore size of the capillary element (2) is configured to allow a liquid aerosol-forming substrate (14) from the liquid storage portion (10) to be conveyed from the first end of the capillary element (4) to the second end of the capillary element (6) by capillary action,

wherein the average pore size of the capillary element (2) varies from large pores (12) at the first end of the capillary element (4) to small pores (16) at the second end of the capillary element (6) such that a pore size gradient from the first end of the capillary element (4) to the second end of the capillary element (6) is provided,

wherein the average pore size of the small pores (16) is between 2 and 8 microns, and

wherein the average pore size of the large pores (12) is between 5 and 500 microns,

wherein the aerosol-generating system further comprises a replaceable liquid storage portion (10), detachably connectable to the main body (18), wherein the first end of the capillary element (4) of the vaporiser assembly is inserted into the liquid storage portion (10) when the liquid storage portion (10) is attached to the main body (18), such that the capillary element (2) comes into fluid communication with the liquid aerosol-forming substrate (14) stored in the liquid storage portion (10)."

XIII. The **appellant's arguments** relevant to this decision can be summarised as follows.

Main request

Added subject-matter

Claim 1 as granted, and claim 12 as granted for similar reasons, contained added subject-matter.

Claim 1 as granted was the combination of claims 1, 8 and 9 as originally filed, where the expression "pore size" in claims 8 and 9 had been replaced by the expression "average pore size" and the narrowest range of claim 8 had been combined with the broadest range of claim 9. Both amendments presented the person skilled in the art with new information not disclosed in the original application.

Firstly, it was not directly and unambiguously apparent from the application as filed that the term "pore size" in original claims 8 and 9 referred to an average pore size. Rather, the person skilled in the art would understand from the application as filed that "pore size" did not refer to the average pore size but to the absolute pore size of the pores, with the ranges originally disclosed for the small and large pores thus defining absolute limits for the pore sizes, this being different.

Secondly, the selection of ranges made in claim 1 as granted from the two lists originally disclosed in claims 8 and 9 did not meet the criteria set out in T 1621/16. There was no pointer in the application as filed to select the two ranges defined in claim 1 as granted from different levels of preference, and these ranges were not described in combination as being particularly advantageous. Moreover, the respondent relied on an undisclosed technical contribution of this combination when claiming inventive step, for example, when claiming that small pores with a pore size between 2 and 8 microns prevented liquid from leaking out of the capillary element (see point 2.4.2.2 of the reply).

Indeed, this effect was attributed to "small pores" in general and not specifically to the selected range of 2-8 microns.

Insufficiency of disclosure

The contested patent did not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

Firstly, the patent did not sufficiently disclose what was meant by a pore size, and how a pore size and an average pore size were to be determined in the context of a porous glass capillary element in which the pores formed an irregular continuous network of void structures and had widely varying dimensions in different axes.

Secondly, although the patent mentioned some standard manufacturing techniques (paragraph [0040]) and suggested that the size of the pores was dependent on the pressure applied (paragraph [0015]), it did not provide any details as to what forces should be applied in any of the proposed processes or how they should be applied to produce the claimed gradient.

Thirdly, there was no disclosure of what liquids or liquid properties (e.g. in terms of viscosity) were required to implement the invention for the pore size ranges claimed.

Novelty in view of D1

The subject-matter of claims 1 and 12 as granted was not novel in view of D1.

As supported by paragraphs [0015] and [0016] of the contested patent, the term "porous glass" was to be interpreted broadly. The "glass fibre paper or felt" (page 5, line 20) or "fiberglass or fiberglass containing material" (page 14, line 34) disclosed in D1, which had a porous structure similar to the "porous material with a spongy or fibrous structure" described in paragraph [0036] of the patent, anticipated feature 1b.

In addition, the stepwise change in pore size in the capillary element of the embodiment disclosed in Figures 2 and 3 of D1, which consisted of two porous bodies joined together and made respectively of first and second porous materials having different pore sizes, constituted a pore size gradient as defined by feature 1g. D1 itself equated two regions of different pore sizes to a pore size gradient (page 17, lines 5-10). In any event, the calculation of the average pore size as a moving spatial average of the pore size across the capillary element, as illustrated on page 8 of the statement of grounds of appeal, inherently resulted in a pore size gradient, at least across the interface between the two materials. Therefore, D1 also disclosed feature 1g.

D1 also anticipated features 1h and 1i since the pore sizes described for the first and second porous materials, 4 microns (page 5, line 34) and between 15 to 40 microns (page 6, lines 5-6), were within the ranges defined by these features. It followed that the embodiment of Figures 2 and 3 of D1 was novelty-destroying for the subject-matter of claims 1 and 12 as granted.

Furthermore, D1 also disclosed an alternative embodiment in which the capillary element was made of a single capillary material which was treated to produce a pore size gradient (page 6, lines 18-22). The person skilled in the art would understand that the disclosure of suitable pore sizes for the first and second porous capillary materials also implicitly applied to this alternative embodiment. Therefore, this alternative embodiment was also novelty-destroying for claims 1 and 12 as granted.

Inventive step starting from D1

The respondent's submissions in support of inventive step filed with its letter of 5 December 2024, i.e. after the notification of the Board's communication under Article 15(1) RPBA, could and should have been filed earlier. They should not be admitted.

In any event, even if D1 were considered not to disclose feature 1b, this feature would not render the subject-matter of claims 1 and 12 as granted inventive starting from the embodiment of D1 in which a capillary material was treated to produce a pore size gradient.

The person skilled in the art would have understood that the ceramic and other ceramic-based materials such as sintered powders (page 4, lines 5-30) disclosed in D1 were suitable for making the capillary element of that embodiment. Indeed, compression of the capillary material as shown in Figure 4 was only one non-limiting example treatment for producing the pore size gradient (page 6, line 3: "Preferably"). If the invention of the contested patent was sufficiently disclosed, particularly given the reference to the manufacture of ceramics in paragraph [0015], as the Board had

concluded, this meant conversely that the person skilled in the art would have had no difficulty in carrying out a treatment for producing a pore size gradient as disclosed in D1 for a capillary element made from ceramic or ceramic-based materials.

Since the technical effects listed in the contested patent for a capillary element made from porous glass, namely improved cleaning and heat resistance (paragraphs [0006] to [0008]), were also achieved by a capillary element made of ceramic-based materials, the objective technical problem to be solved starting from this embodiment was simply to find an alternative material for the capillary element.

In view of the common general knowledge, for example, as supported by D2 (see paragraph [0028]) or D3 (see paragraph [0061] of D3a), it would have been a routine option for the person skilled in the art faced with this technical problem to make a capillary material from porous glass instead of the exemplary ceramic or ceramic-based capillary materials disclosed in D1, for example, to use glass-based sintered powders instead of ceramic-based sintered powders. In this way, the person skilled in the art would have arrived at the subject-matter of claims 1 and 12 as granted without any inventive step.

This inventive-step objection did not constitute an amendment of the appellant's appeal case. In particular, it built on the objection raised in point 5.1 on pages 9-11 of the statement of grounds of appeal.

Admittance of auxiliary requests I to VII

None of auxiliary requests I to VII should be admitted.

These requests did not represent a convergent development of the main request - the claims as granted - but modified it in entirely divergent directions.

Moreover, auxiliary requests IV and V had not been admissibly raised in the opposition proceedings. They had been filed late, after the date set by the opposition division under Rule 116 EPC, and could have been filed earlier.

Auxiliary requests VI and VII, filed on appeal, could and should have been filed in the opposition proceedings. In addition, auxiliary request VI was *prima facie* unallowable as the lack of antecedent basis for some of the features added to claim 1 of that request rendered the claim unclear.

Auxiliary requests I to VII - clarity; inventive step starting from D1

As argued in connection with the issue of admittance, claim 1 of auxiliary request VI was unclear.

The features added to the independent claims in auxiliary requests I to VII did not render the subject-matter of these claims inventive starting from D1.

The features added in auxiliary requests I, II and V were themselves also disclosed in D1. In any event, the features added in auxiliary requests II, III, VI and VII did not produce a synergistic effect with feature 1b, and each of them solved a separate, independent partial technical problem, the solution of

which would have been obvious to the person skilled in the art, especially in light of D1, D2, D3/D3a or common general knowledge. It was well known in the art that the liquid aerosol-forming substrate was a consumable and could be stored in a separate, replaceable liquid storage portion, as acknowledged in D6 (page 6, lines 27-29) and D1 (Figure 3), which disclosed systems in which the heater was located outside the liquid store.

XIV. The **respondent's arguments** relevant to this decision can be summarised as follows.

Main request

Added subject-matter

Claims 1 and 12 as granted did not contain added subject-matter.

The person skilled in the art would understand that original claims 8 and 9 simply specified the average pore sizes of the small and large pores which were defined in original claim 1, on which claims 8 and 9 depended. The same was true of the passage on page 5, lines 8-10 and 15-16, which had to be read in the context of the broader section to which it belonged, where small and large pores were similarly described. This was also supported by the description on page 9, lines 5-11, of an example embodiment which explicitly specified average pore sizes for the small and large pores which were in the ranges of original claims 8 and 9.

Furthermore, the reference to T 1621/16 was not convincing. The lists in original claims 8 and 9 were

lists of converging alternatives, and the multiple selections made in claims 1 and 12 as granted met the conditions set out in T 1621/16 for such a case.

Insufficiency of disclosure

The contested patent disclosed the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

A person skilled in the art was familiar with the standard concept of "average pore size" for porous materials, including porous glass materials. Using well-established techniques, they would have no difficulty in producing a capillary element made from porous glass and having average pore sizes as defined in claims 1 and 12 as granted. They would also have no difficulty in selecting a suitable liquid aerosol-forming substrate to achieve an optimum embodiment of the current invention.

Novelty in view of D1

The subject-matter of claims 1 and 12 as granted was novel in view of D1.

D1 did not disclose any capillary material made from porous glass as defined by feature 1b. Indeed, the term "porous glass" referred to a glass material which was porous, i.e. which included pores within the body of the glass material, and not merely to a porous material comprising glass in one form or another, such as fibreglass, where porosity resulted from spaces between the glass fibres. This was consistent with the manufacturing methods proposed in the contested patent.

Furthermore, none of the embodiments disclosed in D1 disclosed features 1g, 1h and 1i in combination. The embodiment of Figure 2, comprising two different capillary materials each having a different pore size, did not anticipate a single capillary element having a pore size gradient (feature 1g). In the embodiment of Figure 4, a pore size gradient was created by compressing the capillary material. However, D1 did not disclose any value for the pore sizes in this embodiment, and it was not directly and unambiguously disclosed that the pore sizes mentioned for the first and second capillary materials in the other embodiments also applied to the embodiment of Figure 4.

Inventive step starting from D1

The respondent's submissions of 5 December 2024 should be taken into account. They contained only arguments and, in any event, had been filed in response to the new arguments raised by the Board in its communication under Article 15(1) RPBA.

The inventive-step objection starting from the embodiment of D1 in which the capillary material was treated to produce the pore size gradient raised by the appellant at the oral proceedings before the Board was raised for the first time and should not be admitted at this late stage of the proceedings.

In any event, this objection was not convincing.

The only treatment to produce the pore size gradient disclosed in D1 - and in any event the preferred one - was compression of the capillary material. Since ceramic-based materials were not compressible, they could not have been used to carry out this embodiment

of D1. Moreover, it was unclear whether the disclosed ceramic-based materials had the same advantages as those listed for porous glass in paragraphs [0006] to [0008] of the contested patent.

Therefore, the objective technical problem solved by feature 1b was not simply to find an alternative material for the capillary element, but rather how to provide a capillary element which could be repeatedly reused while avoiding degradation or the build-up of undesirable products.

The person skilled in the art faced with this technical problem would not have expected to find a solution in D2 or D3 and would not have consulted those documents. Moreover, D2 was in a very remote technical field.

In any event, since glass - like ceramics - was not compressible, glass was incompatible with the treatment by compression disclosed in D1. Therefore, the person skilled in the art starting from this embodiment would not have arrived at the claimed subject-matter without hindsight, even considering D2 or D3.

Admittance of auxiliary requests I to VII

Auxiliary requests I to VII should be taken into account. Auxiliary requests I to V were part of the opposition proceedings. The claims of auxiliary requests VI and VII did not contain complex amendments and were based exclusively on claims already filed. Moreover, the person skilled in the art would have had no difficulty in understanding the subject-matter of claim 1 of auxiliary request VI, which was clear. In any case, the alleged lack of clarity was removed in auxiliary request VII.

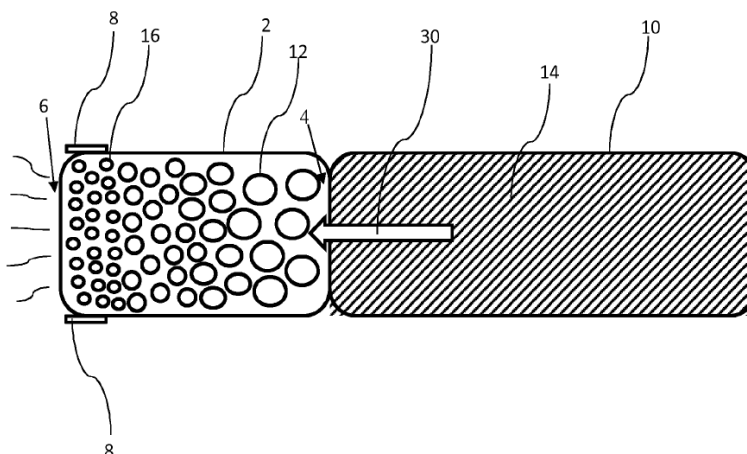
Auxiliary requests I to VII - clarity; inventive step starting from D1

The subject-matter of claim 1 of each of these requests was inventive starting from D1 for the same reasons as those advanced for the main request. The feature added to claims 1 and 12 in auxiliary request II was not disclosed in D2 or D3. The arrangement defined in claim 1 of auxiliary requests VI and VII, which allowed the capillary element to be reused with multiple liquid storage portions and thus, in synergy with feature 1b, improved the reusability of the main body, was not disclosed or suggested in the prior art cited by the appellant. Furthermore, as discussed in connection with the issue of admittance, claim 1 of auxiliary requests VI and VII was clear.

Reasons for the Decision

1. The subject-matter of the contested patent

- 1.1 The contested patent relates to a vaporiser assembly for an aerosol-generating system and a method for manufacturing this vaporiser assembly, defined in independent claims 1 and 12 respectively.
- 1.2 An example of a vaporiser assembly according to claim 1 as granted is shown in Figure 1, reproduced below. This vaporiser assembly comprises a capillary element (2) made from porous glass (feature 1b) and having a first end (4) and a second end (6). The first end (4) is configured to be fluidly connected to a liquid storage portion (10), and a heater element (8) is provided at the second end (6).



Claim 1 provides that the pore size of the capillary element (2) is configured to allow a liquid aerosol-forming substrate (14) from the liquid storage portion (10) to be conveyed from the first end of the capillary element (4) to the second end of the capillary element (6) by capillary action (feature 1f) and that the average pore size of the capillary element (2) varies from large pores (12) at the first end of the capillary element (4) to small pores (16) at the second end of the capillary element (6) such that a pore size gradient from the first end of the capillary element (4) to the second end of the capillary element (6) is provided (feature 1g).

In addition, claim 1 specifies that the average pore size of the small pores (16) is between 2 and 8 microns and that the average pore size of the large pores (12) is between 5 and 500 microns (features 1h and 1i).

According to paragraphs [0006] to [0009] of the patent specification, this leads to a capillary element which is easier to clean and has an increased heat resistance, thereby improving the reusability of the vaporiser assembly.

- 1.3 Claim 12 as granted defines a method for manufacturing the vaporiser assembly, features 12a to 12i of claim 12 corresponding substantially to features 1a to 1i of claim 1. Therefore, the considerations set out below for the apparatus claim 1 of a given request also apply *mutatis mutandis* to the method claim - if any - of that request.

2. Main request

2.1 Added subject-matter

It is common ground that claim 1 as granted is the combination of claims 1, 8 and 9 of the application as originally filed, where:

- (a) the expression "pore size" in claims 8 and 9 has been replaced by "average pore size"
- (b) the narrowest range of claim 8 has been combined with the broadest range of claim 9

Contrary to the appellant's argument, none of these amendments presents the person skilled in the art with new information not disclosed in the application as filed, and the subject-matter of claim 1 as granted therefore complies with Article 123(2) EPC. Similar considerations apply to claim 12 as granted.

2.1.2 Amendment (a) - "average" pore size

The appellant argued that it was not directly and unambiguously apparent from the application as filed that the term "pore size" in original claims 8 and 9 referred to an average pore size.

The Board disagrees. Due to the dependency of both claims 8 and 9 on original claim 1, the small and large

pores referred to in the former are clearly the small and large pores defined in the latter in connection with the variation of the "average pore size" along the capillary element between its first and second ends, which is such that a "pore size gradient" is provided between the first and second ends (feature 1g of original claim 1). Therefore, as argued by the respondent, the person skilled in the art would understand that claims 8 and 9, although using the term "pore size", actually specify the "average pore size" of these small and large pores.

The fact that another feature of original claim 1, feature 1f, explicitly uses the term "pore size" and not "average pore size" does not contradict this understanding. Feature 1f requires that the "pore size" of the pores of the capillary element be configured - i.e. sufficiently small - to allow the liquid aerosol-forming substrate to be conveyed through the capillary element by capillarity. This applies to all pores of the capillary material without any distinction, and indeed feature 1f makes no distinction between small or large pores. The person skilled in the art would therefore have no reason to consider that the different pore sizes defined in claims 8 and 9 for the small and large pores respectively specify the "pore size" referred to in feature 1f.

Moreover, this understanding of the original claims also applies to the passage of the original description on page 5, lines 8-10 and 15-16, referred to by the appellant, where the wording of the claims is repeated. Indeed, as argued by the respondent, this passage must be read in the context of the broader section to which it belongs, where small and large pores are similarly described in relation to the variation of the average

pore size and the pore size gradient across the capillary element. In addition, the description on page 9, lines 5-11, of an embodiment with "average" pore sizes for the small and large pores in the ranges of original claims 8 and 9 further supports this understanding.

It follows that amendment (a) does not add matter.

2.1.3 Amendment (b) - selection of pore sizes ranges

The appellant argued that the combination of ranges defined by features 1h and 1i, resulting from multiple selections from the two lists originally disclosed in claims 8 and 9, went beyond the content of the original application because the criteria set out in T 1621/16 for these selections to comply with Article 123(2) EPC were allegedly not met.

According to the competent Board in T 1621/16, a claim amended on the basis of multiple selections from lists of converging alternatives might be considered to meet the requirements of Article 123(2) EPC if both the following two criteria are met (see catchword):

- (1) "the subject-matter resulting from the multiple selections is not associated with an undisclosed technical contribution"
- (2) "the application as filed includes a pointer to the combination of features resulting from the multiple selections"

Criterion (1) was found in subsequent decision T 1937/17 (see Reasons 4.3.1 and 4.3.2) to be not relevant for assessing compliance with the requirements of Article 123(2) EPC. In decision T 1937/17, the Board

considered that for judging the allowability of amendments with regard to Article 123(2) EPC, only the "gold standard" that the Enlarged Board originally formulated in G 3/89 (Order) is relevant. Decision T 1937/17 was endorsed by a number of other decisions (T 2790/18, Reasons 1.1.2; T 1824/22, Reasons 21; T 1766/22, Reasons 1.10; T 1408/21, Reasons 1.5; T 1261/21, Reasons 4.2.5; T 0795/21, Reasons 4.1.5; T 0579/23, Reasons 1.5). The current Board also endorses the considerations in T 1937/17 and holds that the only relevant criterion for the allowability of an amendment under Article 123(2) EPC is the gold standard set out by the Enlarged Board and confirmed by the established case law of the boards, namely, if the skilled person is presented with technical information which they would not derive directly and unambiguously, using common general knowledge, from the application as filed. This question has to be answered on the merits of a case.

In the case at hand, the person skilled in the art understands from the application as filed that the small pores at the first end, in addition to contributing together with the large pores at the second end to the provision of a pore size gradient along the capillary element (see original claim 1; paragraph bridging pages 4 and 5 of the original description), also have the effect of preventing the liquid substrate from leaking out of the capillary element (see page 5, line 7). This effect results from the small pore size of the small pores at the first end and is independent of the pore size of the large pores at the second end. Thus, the person skilled in the art concludes that to control and prevent potential leakage of the liquid substrate at the first end of the capillary element, the pore size of the smaller pores

can be adjusted independently of the pore size of the larger pores - as long as a gradient of pore size as defined in feature 1g is provided. This constitutes a direct and unambiguous disclosure that the broader range for the large pores of original claim 9 (between 5 and 500 microns) can be combined with each of the four ranges and in particular with the narrower range (between 2 and 8 microns) of original claim 8.

Hence, amendment (b) does not add matter either.

The Board also notes that in the current case the application of the criteria laid down in T 1621/16 would not have led to a different conclusion. First, the lists of pore size ranges disclosed in original claims 8 and 9 are lists of converging alternatives, with each of the narrower options disclosed (whether a range or a single value) being fully encompassed by all of the preceding, less preferred, broader options. Second, as explained above, there is for the person skilled in the art a direct and unambiguous disclosure of the claimed combination. As a consequence, a pointer as required by T 1621/16 is considered to be present. Finally, the subject-matter resulting from this selection is not associated with any technical contribution other than controlling the effect of preventing liquid from leaking out of the capillary element - while generating a pore size gradient across the capillary element - i.e. it is not associated with any technical contribution not disclosed in the application as filed.

2.2 Sufficiency of disclosure

At the oral proceedings before the Board, both parties referred to their written submissions on sufficiency of

disclosure, which had been challenged by the appellant. The Board therefore sees no reason to depart from its preliminary view, as expressed in its communication under Article 15(1) RPBA (see point 5) and reiterated below, that the appellant's objections in this respect are not convincing.

Indeed, as argued by the respondent, the person skilled in the art would be able to manufacture a vaporiser assembly as claimed in claim 1 as granted, without undue burden, using common general knowledge and the information contained in the patent specification.

The person skilled in the art would be able to make a capillary element from porous glass with pores and a pore size gradient as claimed. The techniques referred to in paragraphs [0015] and [0040], in particular for ceramics, are well-established techniques with which the person skilled in the art would be familiar. Furthermore, the person skilled in the art would routinely be able to measure the pore size of a porous glass material and would have no difficulty in selecting a suitable liquid aerosol-forming substrate that can be transferred by capillarity through such a capillary element, even in the absence of further details about the liquid in claim 1.

The Board therefore concludes that the contested patent discloses the claimed invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

3. *Novelty in view of D1*

Contrary to the appellant's view, the subject-matter of claims 1 and 12 is novel in view of D1.

3.1 It is common ground that D1 discloses various embodiments of a vaporiser assembly for an aerosol-generating system comprising features 1a and 1c to 1f. The parties dispute whether D1 also discloses features 1b and 1g to 1i.

3.2 *Feature 1b (capillary element made from porous glass)*

3.2.1 The Board agrees with the respondent that the person skilled in the art would understand that the term "porous glass", in the context of the contested patent, refers to a glass material which is porous, i.e. which contains pores within the body of the glass material itself, and not merely a porous material comprising glass in one form or another, such as the "glass fibre paper or felt", "fiberglass" or "fiberglass containing material" disclosed in D1 (page 5, line 20 and page 14, line 34), in which the pores are formed by the spaces between the various individual glass fibres.

While it is true that paragraph [0015] of the contested patent describes that porous glass can be made from glass particles, i.e. from a plurality of individual glass objects, the reference in paragraph [0015] to the "similar" manufacturing of ceramics implies, contrary to the appellant's argument, that the glass particles are similarly subjected to high temperatures to be "assembled", i.e. fused together, to produce the porous glass described.

However, D1 does not disclose any similar heat treatment applied to the glass fibres, which are simply described as being "contain[ed]" or "compris[ed]" in the capillary material. Moreover, compressing a material containing or consisting of such glass fibres

to create pores of a certain size between the glass fibres as a result of the compression applied, as disclosed in D1, page 6, lines 15-17, does not render that material a porous glass either.

The appellant's reference to paragraph [0036] of the contested patent, according to which a porous material has a "spongy or fibrous structure", is not convincing. The fact that glass fibres may have a porous structure similar to the "porous material with a spongy or fibrous structure" described in that paragraph does not make them a porous glass, but rather what paragraph [0036] itself describes as a "conventional porous material".

Therefore, contrary to the appellant's argument, the glass-containing materials disclosed in D1 do not anticipate a porous glass as defined in feature 1b.

3.2.2 Moreover, even considering that glass is a well-known subtype of ceramic materials, the general disclosure of ceramic-based capillary materials in D1, such as ceramic-based "sintered powders" or "ceramic" (page 4, lines 26-27 and 30), cannot, in any event, anticipate a more specific material such as porous glass.

3.2.3 It follows that D1 does not disclose feature 1b. For this reason alone, the subject-matter of claims 1 and 12 as granted is novel in view of D1.

3.3 *Feature 1g (pore size gradient) and features 1h and 1i (specific average pore size ranges)*

The appellant referred to the following two embodiments of D1.

3.3.1 Embodiment of Figures 2 and 3

In the embodiment of Figures 2 and 3, the capillary element comprises two porous bodies 36, 38 joined together and made of a first capillary material and a second capillary material respectively, each having a different pore size (see pages 14 and 15).

It is common ground that the pore sizes generally disclosed for the first and second capillary materials, such as 4 microns (page 5, line 34) and between 15 and 40 microns (page 6, lines 5-6), which are respectively included in the ranges defined by features 1h and 1i, deprive these features of novelty.

However, contrary to the appellant's argument, the person skilled in the art would not consider the stepwise change in pore size in the capillary element of this embodiment to be a pore size gradient, let alone a pore size gradient from the first end of the capillary element to the second end of the capillary element, as defined by feature 1g. Contrary to the appellant's assertion, the reference to a "gradient in pore size or porosity" on page 17, lines 5-10, does not refer to such a stepwise change in pore size across the capillary element but to the embodiment described further on page 6 as being explicitly provided with a pore size gradient. This further embodiment is discussed in point 3.3.2 below.

The appellant also argued that the calculation of the average pore size as a moving spatial average of the pore size across the capillary element, as disclosed in paragraph [0023] of the contested patent, inherently resulted in the embodiment of Figures 2 and 3 being provided with a pore size gradient, at least across the

interface between the two capillary materials, as illustrated on page 8 of the statement of grounds of appeal. The Board finds this argument artificial and unpersuasive. Without the benefit of hindsight, the person skilled in the art would simply consider the capillary element of that embodiment to be formed of two elements each having a nominal (average) pore size. However, as discussed above, this does not anticipate a pore size gradient.

It follows that this embodiment of D1, while disclosing features 1h and 1i, does not disclose feature 1g.

3.3.2 Embodiment in which the capillary element is treated to produce a pore size gradient

The appellant also referred to the alternative embodiment disclosed on page 6, lines 18-34, in which the capillary element is made of "a single continuous element of the same base material" which is expressly "treated" to produce a "gradient of pore size or porosity", for example, by "compress[ing]" the capillary material with a degree of compression varying along the capillary element as shown in Figure 4. This alternative embodiment anticipates feature 1g.

The respondent did not dispute this but argued that D1 did not disclose any pore size values for this embodiment. The Board disagrees. As argued by the appellant, the person skilled in the art would understand that the general disclosure of suitable materials and pore sizes for the first and second capillary materials just a few paragraphs above (see page 5, lines 33-34; page 6, lines 5-6; point 3.3.1 above, second paragraph) also applies to this alternative embodiment, namely for the first and second

ends of the capillary element between which a pore size gradient is provided. It follows that D1 also discloses features 1h and 1i in combination with feature 1g.

3.4 *Inventive step starting from D1*

- 3.4.1 Contrary to the respondent's assertion, the inventive-step objection to claims 1 and 12 as granted raised by the appellant at the oral proceedings before the Board corresponds to one of the objections discussed in the decision under appeal (see Reasons 5.1 to 5.5.3), in line with Article 12(2) RPBA. It also corresponds to the objection raised in point 5.1 on pages 9-11 of the statement of grounds of appeal. This objection thus does not constitute an amendment of the appellant's appeal case, and the Board has no power to disregard it.
- 3.4.2 Even taking into account the respondent's submissions in its letter of 5 December 2024 - which the appellant requested be disregarded - the Board finds this inventive-step objection to be persuasive.
- 3.4.3 As set out in point 3. above, the subject-matter of claim 1 as granted differs from the alternative embodiment of D1 in which the capillary element is made from a single capillary material treated to produce a pore size gradient (see point 3.3.2) only by virtue of feature 1b, i.e. that the capillary material used to make the capillary element is porous glass.
- 3.4.4 As argued by the appellant, the technical effects achieved by feature 1b (increased heat resistance and easier cleaning), cited by the respondent with reference to paragraphs [0006] to [0008] of the contested patent, are also achieved by making the

capillary element from ceramic or a ceramic-based sintered powder as disclosed on page 4, lines 25-30, of D1. The respondent has not provided any convincing reason, and the Board sees none, why this would not be the case.

- 3.4.5 The appellant further argued that compression of the capillary element was disclosed in D1 only as one possible example of a treatment suitable for producing the pore size gradient, as indicated by the term "Preferably" on page 6, line 23. This is convincing. Consistent with the conclusion reached on the sufficiency of the disclosure (see point 2.2 above), the Board agrees that the person skilled in the art would have no difficulty in making a capillary element with a pore size gradient as defined by feature 1g and average pore sizes in accordance with features 1h and 1i from a capillary material disclosed in D1 which is incompressible, such as ceramic or ceramic-based sintered powder (page 4, lines 25-30). Hence, departing from the preliminary opinion expressed by the Board under point 10 of its communication (when discussing auxiliary request V), D1 discloses making a capillary element with a pore size gradient that is entirely made from the incompressible ceramic or ceramic-based sintered powder.
- 3.4.6 It follows that the objective technical problem formulated by the respondent starting from this alternative embodiment of D1 is too ambitious. As argued by the appellant, the objective technical problem can instead be simply formulated as seeking an alternative capillary material to the ceramic or ceramic-based materials disclosed in D1 to make the capillary element of this embodiment.

3.4.7 As argued by the appellant, the person skilled in the art would have been aware that both porous glass and porous ceramic can equally well be used as capillary materials for the capillary element of a vaporiser assembly. This is reflected, for example, in D2 (see paragraph [0028]: "porous sintered glass or porous sintered ceramic") and D3 (see paragraph [0061] of D3a), each of which discloses a vaporiser assembly for an aerosol-generating system similar to that claimed in the contested patent.

Consequently, it would have been a routine option for the person skilled in the art faced with the above technical problem to use porous glass instead of the exemplary ceramic or ceramic-based capillary materials disclosed in D1, for example, to use a glass-based sintered powder instead of a ceramic-based sintered powder. In this way, the person skilled in the art would have arrived at the subject-matter of claims 1 and 12 as granted without any inventive skill.

It follows that the subject-matter of claims 1 and 12 as granted does not involve an inventive step starting from D1. Consequently, the main request is not allowable.

4. Admittance of auxiliary requests I to VII

The admittance of auxiliary requests I to VII was disputed by the appellant. Both parties referred to their written submissions. The Board therefore saw no reason to depart from its preliminary view as set out in point 8 of its communication under Article 15(1) RPBA, which is repeated below.

4.1 Auxiliary requests I to III are identical to auxiliary requests I to III filed and maintained in the opposition proceedings. These requests were filed before the final date fixed under Rule 116(1) EPC for the submission of written submissions in preparation for the oral proceedings and were therefore admissibly raised within the meaning of Article 12(4) RPBA. The Board therefore has no power to disregard them.

4.2 Auxiliary requests IV and V were also submitted in the opposition proceedings, but after the final date fixed under Rule 116(1) EPC. In view of the opposition division's conclusion on the main request, it was not necessary to decide on the admittance of these requests. Auxiliary request VI was filed for the first time with the respondent's reply to the statement of grounds of appeal, i.e. at the earliest possible stage of the appeal proceedings.

Pursuant to Article 12(4) RPBA, the admittance of these requests lies within the discretion of the Board.

The amendments contained in these requests are not complex, are easy to understand and appear *prima facie* to be reasonable attempts to overcome the appellant's objections to patentability.

The Board decided to admit auxiliary requests IV to VI.

4.3 As auxiliary request VII was filed after the respondent had filed its reply, its admittance is left at the discretion of the Board under Article 13(1) RPBA.

The respondent explained that this request was intended to overcome a clarity objection raised by the appellant against claim 1 of auxiliary request VI. Compared to

claim 1 of the latter, claim 1 of auxiliary request VII was merely reformulated without raising any new issue.

The Board decided to admit auxiliary request VII.

5. Auxiliary requests I to V

Contrary to the respondent's view, the amendments made to the independent claims in auxiliary requests I to V do not render their subject-matter inventive over D1. These requests are therefore not allowable either.

5.1 Auxiliary requests I, IV and V

5.1.1 As set out in the Board's communication under Article 15(1) RPBA (see point 9.1), D1 also discloses the additional features added to claims 1 and 12 in auxiliary requests I and IV, namely:

- the heater element being directly in contact with the second end of the capillary element (auxiliary request I): see page 14, lines 23-24; page 4, line 35

- the porous glass having an internal structure which allows liquids to be conveyed from the first end of the capillary element to the second end of the capillary element, the porous glass comprising pores which enable liquid to travel through the capillary element (auxiliary request IV): these features result inherently from the capillary properties of the capillary elements disclosed in D1

Therefore, following the reasoning set out in point 3.4 above, the person skilled in the art starting from D1 would at the same time arrive at a vaporiser assembly

and a method of manufacturing this vaporiser assembly comprising these additional features.

- 5.1.2 In addition, in the alternative embodiment of D1 taken as the starting point in the inventive-step objection set forth in point 3.4 above, the capillary element is "made from a single continuous element of the same base material" (page 6, lines 18-19; emphasis added by the Board), i.e. it is "entirely" made from (incompressible) ceramic or a ceramic-based sintered powder.

Therefore, when replacing the ceramic or ceramic-based sintered powder with porous glass in accordance with the reasoning set out in point 3.4 above, the person skilled in the art starting from D1 would arrive at a vaporiser assembly and a method of manufacturing this vaporiser assembly in which the capillary element is also "entirely" made from porous glass, as required by amended features 1b and 12b in auxiliary request V.

- 5.1.3 The parties did not comment on this at the oral proceedings before the Board but referred to their written submissions.

5.2 *Auxiliary requests II and III*

- 5.2.1 The additional features added to the independent claims in auxiliary requests II and III are not disclosed in D1. Contrary to the appellant's argument, the "coating" disclosed in D1, page 6, line 3, is a coating "to reduce hydrophobicity" and is not necessarily fluid impermeable.

- 5.2.2 As argued by the appellant and set out in the Board's communication under Article 15(1) RPBA (see point 9.2),

these additional features do not produce a synergistic effect with feature 1b, and each of them solves a separate, independent partial technical problem, the solution of which would have been obvious to the person skilled in the art, especially in light of D2 and D3.

To improve the tightness of the capillary element, the person skilled in the art would have been motivated by the teaching of D2 (see last sentence of paragraph [0029]) to include a fluid-impermeable coating applied to the outer surface of the capillary element.

Providing the heater element as a metallic coating would have been an obvious alternative to the heater element 46 disclosed in D1, as suggested by D3 (see D3a, paragraphs [0011], [0015], [0059] and [0060]).

- 5.2.3 The parties also did not comment on this at the oral proceedings before the Board but referred to their written submissions.

6. Auxiliary request VI - clarity

As argued by the appellant, several of the features added at the beginning of claim 1 in auxiliary request VI have no antecedent basis in the claim, for example, line 5 of claim 1 refers to "the first end of the capillary element (4)", although a capillary element and its first end are not defined until further down in the claim. This renders claim 1 unclear, contrary to the respondent's view.

Even if the added features are derived from claims 9 and 10 as granted, the above lack of clarity has been introduced by the amendment of claim 1. Therefore, this leads to a non-compliance with Article 84 EPC, in

accordance with G 3/14. It follows that auxiliary request VI is also unallowable.

7. Auxiliary request VII

7.1 Clarity

Claim 1 of auxiliary request VII is identical in substance to claim 1 of auxiliary request VI. However, compared to the latter, claim 1 of auxiliary request VII has been reworded and its features reordered to provide an antecedent basis for all the added features.

The Board is satisfied that the resulting claim 1 is clear. This was not disputed by the appellant.

7.2 Inventive step starting from D1

Contrary to the appellant's argument, the subject-matter of claim 1 of auxiliary request VII involves an inventive step starting from D1.

7.2.1 It is common ground that D1 discloses (see Figures 1A and 1B and the corresponding description starting from page 12, line 28) an aerosol-generating system (10) comprising a main body (11), the main body comprising a housing, a power supply (battery 14), electric circuitry (control electronics 16) and a cavity (18) configured to receive a replaceable cartridge (20). This replaceable cartridge itself contains a liquid aerosol-forming substrate and a vaporiser assembly as discussed in point 3. above, in particular including a capillary element (36, 38) and a heater element (46).

7.2.2 It is also common ground that the subject-matter of claim 1 of auxiliary request VII differs from this

known aerosol-generating system in that the vaporiser assembly - including the capillary element and the heater - is comprised in the main body of the system, where the first end of the capillary element of the vaporiser assembly is inserted into the liquid storage portion when the replaceable liquid storage portion, detachably connectable to the main body, is attached to the main body, such that the capillary element comes into fluid communication with the liquid aerosol-forming substrate stored in the liquid storage portion.

These distinguishing features allow the capillary element made from porous glass to be reused with multiple liquid storage portions.

- 7.2.3 The appellant argued that the claimed arrangement was a simple and routine structural configuration of the aerosol-generating systems known in the art and that it would have been obvious to the person skilled in the art to modify the system of D1 to implement these features.

The Board disagrees. In the system of D1, the heater element and the capillary element are both incorporated into the replaceable cartridge and intended to be disposed of when the cartridge is removed from the system and replaced with a new one. There is no suggestion in D1 that these components could be reused. Figure 3 of D1 is merely an exploded view of a cartridge. Therefore, contrary to the appellant's argument, the fact that the heater element 46 and the capillary element 36, 38 are shown at a distance from the liquid storage portion 24, 32, 34 of the cartridge cannot lead the person skilled in the art to the distinguishing features above.

It is true, as argued by the appellant, that D6 discloses (see Figure 2) an aerosol-generating system in which the heater element (coil 16) is located outside the liquid storage portion (liquid store 12). However, this in itself does not suggest that the liquid storage portion could be replaceable. As argued by the respondent, the corresponding description on pages 5 and 6, and more generally the description as a whole, gives no indication of this.

Moreover, the implementation of the above-mentioned distinguishing features in the system of D1 would require significant structural modifications which, in the absence of any suggestion to that effect, go beyond the type of modifications which the person skilled in the art would envisage without exercising an inventive step.

8. Remittal of the case to the opposition division

It follows from the foregoing that none of the appellant's objections prejudices the maintenance of the contested patent on the basis of the claims of auxiliary request VII.

The Board considers it appropriate to remit the case to the opposition division for adaptation of the description, in accordance with Article 111(1) EPC. None of the parties objected.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the opposition division with the order to maintain the patent in the following version:

claims 1 to 9 of auxiliary request VII filed with the letter dated 2 February 2024 and a description to be adapted

The Registrar:

The Chairman:



A. Chavinier-Tomsic

M. Alvazzi Delfrate

Decision electronically authenticated