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Datasheet for the decision of 24 April 2023

Case Number: T 0730/19 - 3.4.01

Application Number: 08778779.2

Publication Number: 2186380

IPC: H05B3/16

Language of the proceedings: EN

Title of invention:
ELECTRIC HEATER

Patent Proprietor:
LG Electronics Inc.

Opponent:
E.G.O. Elektro-Gerätebau GmbH

Headword:
Electric heater / LG Electronics

Relevant legal provisions:
EPC Art. 100(c), 54, 56, 123(2), 84
RPBA 2020 Art. 13(2)

Keyword:
Grounds for opposition - Main Request - added subject-matter (yes)
Novelty - Auxiliary Requests 1,2,3 (no)
Inventive step - Auxiliary Requests 3a,4,4a,4b,5,6,7 (no)
Amendments - Auxiliary Requests 3,4,4a,6,7,8,9,10,11 - added subject-matter (yes)
Claims - clarity - Auxiliary Request 4a (no)
Amendment after summons - Auxiliary Request 4c - taken into account (no)

Decisions cited:
G 0003/14

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Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 0730/19 - 3.4.01

D E C I S I O N
of Technical Board of Appeal 3.4.01
of 24 April 2023

Appellant: (Patent Proprietor)	LG Electronics Inc. 20, Yeouido-dong Yeongdeungpo-gu Seoul 150-721 (KR)
Representative:	Vossius & Partner Patentanwälte Rechtsanwälte mbB Siebertstrasse 3 81675 München (DE)
Appellant: (Opponent)	E.G.O. Elektro-Gerätebau GmbH Rote-Tor-Strasse 14 75038 Oberderdingen (DE)
Representative:	Patentanwälte Ruff, Wilhelm, Beier, Dauster & Partner mbB Kronenstraße 30 70174 Stuttgart (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 11 January 2019 concerning maintenance of the European Patent No. 2186380 in amended form.**

Composition of the Board:

Chair	T. Zinke
Members:	T. Petelski
	R. Winkelhofer

Summary of Facts and Submissions

I. An opposition was filed against the European patent, based on Articles 100(a), (b), and (c) EPC.

II. In an interlocutory decision, the Opposition Division maintained the patent in amended form on the basis of the (then) fourth auxiliary request.

III. The opponent lodged an appeal against this decision, and requests that the decision be set aside and amended such that the patent be revoked.

IV. The opponent bases their arguments on several documents, of which

D6: EP 0 853 444 A2 and
D5: EP 1 161 120 A2

are relevant for the present decision.

V. The proprietor also lodged an appeal and requests that the decision under appeal be set aside and amended such that the opposition be rejected, or the patent be maintained on the basis of one of fifteen auxiliary requests, numbered 1 to 3, 3a, 4, 4a, 4b, 4c and 5 to 11. Of those, Auxiliary Request 4a was filed with the reply to the opponent's appeal, Auxiliary Requests 3a and 4b were filed after notification of a summons to oral proceedings before the Board, and Auxiliary

Request 4c was filed during oral proceedings, whereas all other requests had been filed during opposition proceedings and were re-filed with the proprietor's statement of grounds of appeal.

VI. Claim 1 of the Main Request reads (reference signs removed):

An electric heater, comprising:

a base; and

a heating unit, the heating unit having a plurality of unit heating elements disposed on a plate surface of the base, and at least one non-heating connection portion configured not to heat and conductively connecting the unit heating elements to each other;

characterized in that the heating unit further comprises:

a first heating portion of which inner and outer ends thereof form circular shapes and provided with the plurality of unit heating elements, each unit heating elements having a bar shape, and

a second heating portion disposed radially inside of the first heating portion;

wherein the non-heating connection portion is formed of a material having a low electrical resistance compared to the unit heating elements.

VII. Claim 1 of Auxiliary Request 1 reads (reference signs removed and amendments with respect to claim 1 of the Main Request marked):

An electric heater, comprising:

a base; and

a heating unit, the heating unit having a plurality of unit heating elements disposed on a plate surface of the base, and ~~at least one~~ non-heating connection portion<u>s</u> configured not to heat and conductively connecting the unit heating elements to each other;

characterized in that the heating unit further comprises:

a first heating portion of which inner and outer ends thereof form circular shapes and provided with the plurality of unit heating elements, each unit heating elements having a bar shape, and

a second heating portion disposed radially inside of the first heating portion;

wherein the non-heating connection portion<u>s</u> ~~is~~ <u>are</u> formed of a material having a low electrical resistance compared to the unit heating elements.

VIII. Claim 1 of Auxiliary Request 2 adds to the end of claim 1 of Auxiliary Request 1 the feature (reference signs removed):

..., and wherein the first heating portion and the second heating portion are respectively connected to first power connection portions and second power connection portions for separately being supplied with power.

IX. Claim 1 of Auxiliary Request 3 adds to claim 1 of Auxiliary Request 1, after the definition of the second heating portion, the second-last feature (reference signs removed):

...; wherein each of the non-heating connection portions connects two neighboring of the unit heating elements to each other; and ...

X. Claim 1 of Auxiliary Request 3a differs from claim 1 of Auxiliary Request 3 in that the above feature reads (reference signs removed and amendments with respect to claim 1 of Auxiliary Request 3 marked):

...; wherein each of the non-heating connection portions <u>serially</u> connects <u>exactly</u> two neighboring of the <u>bar-shaped</u> unit heating elements <u>in the first heating portion</u> to each other; and ...

XI. Claim 1 of Auxiliary Request 4 differs from claim 1 of Auxiliary Request 1 in that the following feature is added in place of the feature added by Auxiliary Request 3 (reference signs removed):

...; wherein two neighboring of the unit heating elements are serially connected to each other via a respective one of the non-heating connection portions; and ...

XII. Claim 1 of Auxiliary Request 4a differs from claim 1 of Auxiliary Request 4 in that the above feature reads (reference signs removed and amendments with respect to claim 1 of Auxiliary Request 4 marked):

...; wherein <u>in each case</u> two neighboring of the unit heating elements are serially connected to each other via a respective one of the non-heating connection portions; and ...

XIII. Claim 1 of Auxiliary Request 4b differs from claim 1 of Auxiliary Request 3 in the following, marked amendments (reference signs removed):

..., and a second heating portion <u>having a plurality of unit heating elements and</u> disposed radially inside of the first heating portion;

wherein each of the non-heating connection portions serially connects <u>exactly</u> two

neighboring of the heating elements to each other; and ...

XIV. Claim 1 of Auxiliary Request 4c adds to the end of claim 1 of Auxiliary Request 4b the feature (reference signs removed):

..., and wherein each of the unit heating elements of the second heating portion has a bar shape, is disposed parallel, and is formed to have a different length so that outer ends thereof can form a circular shape.

XV. Claim 1 of Auxiliary Request 5 differs from claim 1 of Auxiliary Request 1 in that the following feature is added to the end of the claim (reference signs removed):

..., and wherein a plurality of non-heating connection portions of the first heating portion are forming an outer circumference of the first heating portion.

XVI. Claim 1 of Auxiliary Request 6 combines the features of claims 1 of Auxiliary Requests 3 and 5.

XVII. Claim 1 of Auxiliary Request 7 combines the features of claims 1 of Auxiliary Requests 4 and 5.

XVIII. Claim 1 of Auxiliary Request 8 corresponds to claim 1 of Auxiliary Request 6, and adds the following feature to the end of the claim (reference signs removed):

...; and wherein each of the unit heating elements of the second heating portion is formed to have a different length so that outer ends thereof can form a circular shape.

XIX. Claim 1 of Auxiliary Request 9 also corresponds to claim 1 of Auxiliary Request 6, but adds the following feature to the end of the claim (reference signs removed):

...; and wherein each of the unit heating elements of the second heating portion has a bar shape, is disposed parallel, and is formed to have a different length so that outer ends thereof can form a circular shape.

XX. Claim 1 of Auxiliary Request 10 is a combination of claim 1 of Auxiliary Request 7 and the additional last feature of Auxiliary Request 9.

XXI. Claim 1 of Auxiliary Request 11 corresponds to claim 1 of Auxiliary Request 8, and adds the following features to the end of the claim (reference signs removed):

...; wherein the first heating portion and the second heating portion are respectively connected to first power connection portions and second power connection portions for separately being supplied with power; and

wherein the first power connection portions and the second power connection portions are arranged outside of the first and second heating portions.

Reasons for the Decision

Content of the patent

1. The patent is about electric heaters for use in cooking appliances. The invention sets out to resolve two problems associated to heaters that have resistive heating elements applied to a substrate.

2. A first problem of such heaters can be caused by an eccentric placement of a cooking utensil on the heating unit such that parts of the heating elements are not covered by the utensil. The uncovered parts cannot dissipate the heat to the utensil, which can lead to large temperature gradients and a resulting damage to the heater. This problem is solved, by the invention, by using bar shaped instead of spiral heating elements, such that an eccentric placement will only lead to small parts of the heating elements being uncovered.

3. A second problem lies in the large amount of heat that can be generated at tight bends of the resistive elements, which can lead to thermal stress and a resulting damage to the heater. The invention solves this problem by connecting the bar-shaped heating elements by non-heating connection portions.

Main Request – amendments

4. The claims of the Main Request are the claims as granted.

5. Claim 1 defines

> *... the heating unit having ... at least one non-heating connection portion...*

Hence, claim 1 encompasses the option of the heating unit having a single non-heating connection portion.

6. This feature was allegedly based on original claim 1, and the corresponding formulation in paragraph [0017] of the original application, according to which

> *... the heating unit having ... at least one of heating connection portions ... and non-heating connection portions...*

7. This formulation can be understood in two ways:

(a) the heating unit having (plural) heating connection portions, or (plural) non-heating connection portions, or both; or

(b) the heating unit having at least one heating connection portion, and at least one non-heating connection portion.

8. The opponent argues in favour of understanding (a), which excludes the option of a single non-heating connection portion; the proprietor argues in favour of

(b), which includes the option of a single non-heating connection portion.

9. However, both, (a) and (b), are technically reasonable understandings of original claim 1. Due to the possibility of two different reasonable interpretations, it is ambiguous whether the heater of original claim 1 is meant to disclose a single non-heating connection portion or not. Hence, the formulation of present claim 1, which includes a single non-heating connection portion, cannot be derived directly and unambiguously from original claim 1.

10. The other parts of the originally filed application exclusively and consistently refer to non-heating connection portions in the plural, and, therefore, can also not serve as a basis for claim 1.

11. As a consequence, claim 1 contains subject-matter in the form of a heating unit with a single non-heating connection portion, which extends beyond the content of the application as filed (Article 100(c) EPC).

12. Therefore, the Main Request is not allowable.

Auxiliary Request 1 - novelty

13. The Opposition Division found that the subject-matter of claim 1 was anticipated by D6.

14. D6 is about an electric heater for a cooking plate. In the embodiment according to Figure 28 of D6, the heater comprises a first, outer heating portion 92, consisting of radially arranged bar-shaped heating elements 29 printed on a base 14. This portion is delimited by

circular outer and inner conductive supply lines 94 and 93, which provide a parallel connection to the outer and inner ends of the bar shaped heating elements, respectively. A second, inner heating portion is located radially inside the inner conductive supply line 93 and is delimited, on its inner side, by a further, innermost conductive supply line 97. The three conductive supply lines are supplied with power through three power terminals 30.

15. According to the proprietor, the subject-matter of claim 1 differs from D6 in the following:

(a) In claim 1, the heating unit has at least one non-heating connection portion, which is formed of a material having lower electrical resistance than the unit heating elements. In the embodiment of Figure 28 of D6 there are no non-heating portions. The supply lines from pads 30 and the circular supply lines 97, 93 and 94 are made from the same resistive material as elements 29, or else there would be cold areas at the 12 and 6 o'clock positions in Figure 28. The voltage drops along the circular portions 93 and 94 would be adjusted such that there was an equal voltage across all radial heating elements 29. D6 does not disclose different materials. The skilled person would understand that all elements are printed in one go from the same material, wherein the desired level of resistance can be adjusted by the width or thickness of the resistive patches, as is suggested by column 23, line 24, and column 22, lines 26 - 35 in the context of the shortening sections 98 in Figure 25.

(b) In claim 1, the non-heating connection portions conductively connect the unit heating elements.

Even if the circular supply lines 93 and 94 in D6 were interpreted as non-heating connection portions, they would still not conductively connect the radial heating elements 29 to each other. A conductive connection of two elements to each other implies a serial connection in the sense that current flows from one element to the other. The portion 93 is one part of a parallel connection and does, therefore, not conductively connect the elements 29.

(c) In claim 1, there is a second heating portion disposed radially inside of the first heating portion. In D6 there is a main heating zone 91, and an additional heating zone 92 that can only be operated together with the main heating zone. Hence, the zones 91 and 92 cannot be operated separately and are no distinct heating portions, but rather form a single heating portion that can be operated in two ways. Further, the zones 91 and 92 share the ring-shaped heating element (supply line) 93, which is a further reason why there are no two separate heating portions with one of them radially inside the other.

16. This is not persuasive, and cannot raise doubts as to the correctness of the findings of the Opposition Division:

As to point (a): It is implicit from D6 that the supply lines 93 and 94 are made from a material with a good conductivity, similar to the supply lines in Figure 25 (column 22, lines 36 - 40). As is implied by the denotation and the purpose of the elements alone, this is different from the resistive material of the heating elements (column

21, lines 29 - 35; column 22, line 30: "Widerstandspaste"; also, column 14, line 2: "Heizwiderstandsmaterialien"). This understanding is supported by column 23, lines 35 - 41, according to which the supply line 93 forms a thermal border between the two heating portions 91 and 92. Hence, supply lines 97, 93 and 94 are "non-heating connection portions". The fact that there might be a gap between the heating portions 29 at the 12 and 6 o'clock positions in Figure 28 (similar to Figure 6 of the patent in suit), provided that the Figures in D6 are roughly to scale, is irrelevant in this context. If, for the sake of argument, the proprietor was correct in that the supply lines were produced from a resistive material, then this would have resulted in a voltage drop along the supply line 94. This voltage drop might, with some effort, have been balanced with respect to the voltage drop along supply line 93 at a single temperature. However, for varying temperatures this would have led to a major imbalance in heating across the heating portion 92, which makes this assumption implausible.

As to point (b): The supply line 93, as a non-heating connection portion, physically connects the inner ends of all heating elements 29 of the outer portion 92 to each other. The supply line 94, as another non-heating connection portion, does so with the outer ends of the same heating elements. Since the non-heating connection portions in form of the supply lines 93 and 94 are conductive, they establish an electrical connection between the respective ends of the heating elements. Therefore, each non-heating connection portion "conductively connects" the heating elements to each other. The

claim wording does not imply that the non-heating connection portions establish a serial connection between the heating elements.

As to point (c): The two heating portions 91 and 92 in Figure 28 of D6 each consist of radially aligned heating elements. The supply lines 97, 93 and 94 are not part of the heating portions. Therefore, the inner heating portion 91 is disposed radially inside the second heating portion 92 in its entirety, without any overlap. The three power terminals 30 allow a separate supply with power of either the inner portion, or the outer portion, or both together. The actual use of the power terminals in D6 is irrelevant for the question of novelty of claim 1. Similarly, Figures 7 and 12 of the patent in suit also show a shared terminal for the supply of the inner and outer heating portions. Since claim 1 neither defines that the non-heating connection portions form part of the heating portions, nor that each heating portion comprises two terminals that are separate from the other terminals, the two heating portions 91 and 92 correspond to those claimed by claim 1.

17. It follows from the above that the subject-matter of claim 1 lacks novelty over D6 (Articles 52(1) and 54(1), (2) EPC).

18. Therefore, Auxiliary Request 1 is also not allowable.

Auxiliary Request 2 - novelty

19. In addition to the arguments set out with respect to Auxiliary Request 1, the proprietor argues that the feature defining the first and second heating portions to be "respectively connected to first power connection portions and second power connection portions for separately being supplied with power" means that there are two separate power connection portions for each heating portion, thereby excluding that the first and second heating portions share a common power connection portion, as it is the case for the lowest of the power terminals 30 in Figure 28 of D6.

20. This argument is not persuasive.

21. The first heating portion 92 in Figure 28 of D6 is connected to the central and lower of the three power connection portions 30, which constitute "first power connection portions", whereas the second heating portion 91 is connected to the central and upper of those power connection portions, constituting "second power connection portions". This allows to separately supply the first and second portions with power, even if not at the same time. Claim 1 of the patent in suit does not require that both heating portions be supplied at the same time by power, and does also not exclude that the first and second power connection portions share one of their power connections.

22. It follows that the subject-matter of claim 1 lacks novelty over D6 (Articles 52(1) and 54(1), (2) EPC).

23. Hence, Auxiliary Request 2 is likewise not allowable.

Auxiliary Request 3 - amendments and novelty

24. The proprietor relies on Figures 5, 6, and 7 as a basis for the amendment to claim 1, according to which "each of the non-heating connection portions connects two neighbouring of the unit heating elements". The opponent disputes this basis.

25. Figures may serve as a basis for amendments, provided that the skilled person would derive the disclosure directly and unambiguously from them, using common general knowledge (cf. Case Law of the Boards of Appeal, 10th edition, II.E.1.13).

26. Figures 6, 7 and 12 illustrate embodiments in accordance with claim 1. The proprietor rightly points out that they all disclose, directly and unambiguously, connection portions that (serially) connect exactly two (of several) neighbouring, bar-shaped unit heating elements in the first heating portion. Also Figures 4 and 5 disclose such connection portions, although the shapes of the heating elements or the arrangement of heating portions are different from those defined in claim 1. Other kinds of connections by non-heating connection portions are neither disclosed nor hinted at in the application as filed.

27. On the other hand, the opponent correctly observes that the formulation "wherein each of the non-heating connection portions connects two neighbouring of the unit heating elements" in claim 1 does not exclude that certain connection portions connect more than said two neighbouring unit heating elements with each other. Such information, however, was not originally disclosed, because the application as filed only discloses connection portions that connect exactly two

neighbouring heating elements with each other, and nothing else.

28. The proprietor counters that this feature must be understood in a narrower sense as a serial electrical connection between only two neighbouring heating elements, because this is the only possible interpretation that is technically meaningful. This argument is not persuasive. There are arrangements in which one connection portion connects more heating elements to each other than merely two neighbouring ones, which are also technically meaningful. For example, a connection portion could be used at each end of a parallel connection of three or more heating elements, each connection portion electrically connecting the three or more respective ends of those heating elements to each other, including the two neighbouring ones.

29. Hence, the subject-matter of claim 1 extends beyond the content of the application as filed (Article 123(2) EPC).

30. Moreover, it is noted that claim 1 does not exclude that each non-heating connection portion connects more unit heating elements to each other than merely two neighbouring ones. In Figure 28 of D6, each of the connection portions 93 and 94 connects all unit heating elements of the outer first heating portion to each other, including two neighbouring of the unit heating elements.

31. Hence, the subject-matter of claim 1 also lacks novelty over D6 (Articles 52(1) and 54(1), (2) EPC).

32. Therefore, Auxiliary Request 3 is not allowable either, for added subject-matter and lack of novelty.

Auxiliary Request 3a - inventive step

33. The opponent brought forward an inventive step attack against claim 1 starting from the embodiment illustrated by Figure 29 of D6, and also considering the teaching of D5.

34. The embodiment relating to Figure 29 differs from the embodiment of Figure 28, which was discussed in respect of the higher-ranking auxiliary requests, in that each of the first (outer) and second (inner) heating portions is constituted by a respective circular meandering heating track. In contrast to the proprietor's view, the meandering heating track can be understood as a sequence of bar-shaped, radially aligned unit heating elements, which are serially connected to each other by curve portions. Thus, each of the curve portions is a heating connection portion that serially connects exactly two neighbouring of the bar-shaped unit heating elements.

35. As a consequence, the subject-matter of claim 1 differs from the embodiment of Figure 29 in D6 in that the connection portions are non-heating and, accordingly, formed from a material with a lower electrical resistance compared to the unit heating elements.

36. The proprietor argues on that basis that the skilled person would not arrive at the subject-matter of claim 1. According to the proprietor, the problem lay in the eccentric placement of the cooking utensil and the resulting possible damage, as was stated in paragraph

[0019] of the patent in suit. However, such a problem was not present in D6, because the cooking utensils were placed concentrically with the heating portions. Even if there were such a problem, the skilled person would not have given up the meandering pattern illustrated by Figure 29 of D6, because this pattern was at the heart of the concept of this embodiment. Further, the skilled person would not have considered D5, because D5 was directed at a water heater, in which the problem of an eccentric placement did not occur. Even if D5 were considered, the silver bridges of the embodiment according to Figure 1 would not have been suited for use in D6. Hence, the skilled person would have had to turn to Figures 5 or 6 of D5 in order to find suitable bridges, a step, which the skilled person could have only taken with hindsight. Also, the printing of the entire pattern in one go would no longer have been possible in D5 when using silver bridges.

37. This argument is not persuasive.

38. The technical effect of the difference lies in a more uniform heat distribution. The objective technical problem is, therefore, seen in reducing heat gradients, which might lead to damage of the heater. This problem is mentioned in paragraph [0018] of the patent in suit. The eccentric placement of a cooking utensil, as mentioned in paragraph [0019], does not follow from the difference between claim 1 and D6, because the problem of an eccentric placement would only be solved if the non-heating connection portions were positioned at the radially outer portion of the heating portion. This, however, is not defined by claim 1.

39. This problem of reducing heat gradients was a common and well-known problem in the design of electric heaters, of which the person skilled in the art of heaters was well aware and realistically aimed to solve, even if not explicitly mentioned in relation with the embodiment of Figure 29 in D6.

40. The skilled person would have been aware of D5, which lies in the same field of electric heaters. D5 mentions the problem, here referred to as "current crowding" in tight bends of heating tracks, in paragraph [0039]. The solution offered by D5 (see paragraphs [0038] and [0039]) consists in replacing the tight bends by "conductive bridges" 11. These bridges are made from a material with a lower resistivity than that of the heating track, for example from a silver material ([0040]).

41. The skilled person, trying to solve the problem associated with the heat generated at the tight bends between the unit heating elements in Figure 29 of D6, would have applied the solution offered by D5 and replaced the resistive curve portions between the bar-shaped unit heating elements with the conductive bridges suggested by D5. This would not have been a problem during production, because the printing of the heating track and the conductive supply lines requires a printing with two different materials anyway. Further, there was no need to consider the embodiments illustrated by Figures 5 or 6. The resulting electric heater, which would have a heat uniformity similar to the arrangement of Figure 28 of D6, comprises all features of claim 1. The meandering pattern of Figure 29 would have been preserved.

42. Hence, the subject-matter of claim 1 does not involve an inventive step in view of D6 in combination with D5 (Articles 52(1) and 56 EPC).

43. Therefore, Auxiliary Request 3a is also not allowable.

Auxiliary Request 4 - amendments and inventive step

44. The proprietor relies on Figures 5, 6 and 7 (and potentially 12) as a basis for the amendment to claim 1, which defines that "two neighbouring of the unit heating elements are serially connected to each other via a respective one of the non-heating connection portions".

45. Even when read in context with the whole claim, as emphasized by the proprietor, this feature does not exclude that other than two particular neighbouring of the unit heating elements are connected to each other by connection portions in other ways. For example, of a total of four unit heating elements, only the first and second might be connected serially via a respective connection portion, while the third and fourth might be connected in parallel by two further connection portions. Such mixed serial and parallel options are not unrealistic, for example, in cases in which high supply voltages are to be avoided and the heating elements have different lengths. The information that not all heating elements are connected in series was, however, not disclosed by the application as filed. The figures merely disclose that all heating elements of the first heating portion are connected in series by the connection portions, wherein each connection portion connects exactly two neighbouring of the heating elements.

46. Hence, the subject-matter of claim 1 extends beyond the content of the application as filed (Article 123(2) EPC).

47. Claim 1 covers, amongst others, the case that each of the unit heating elements is connected to its neighbouring unit heating elements by a respective non-heating connection portion. This is exactly the configuration of the electric heater at which the skilled person would have arrived according to the above inventive step argumentation relating to Auxiliary Request 3a.

48. Hence, claim 1 of Auxiliary Request 4 lacks an inventive step for the same reasons as claim 1 of Auxiliary Request 3a (Articles 52(1) and 56 EPC).

49. For the above reasons of added subject-matter and lack of inventive step, Auxiliary Request 4 is not allowable.

Auxiliary Request 4a - amendments and clarity

50. In claim 1, the expression "in each case" was added such the respective feature reads "... wherein in each case two neighbouring of the unit heating elements are serially connected to each other via a respective one of the non-heating connection portions".

51. Contrary to the proprietor's view, the claim wording does not exclude arrangements in which one heating element has more than two neighbouring heating elements. For example, in the arrangement of Figure 12 of the patent in suit, a first heating portion 521

consists of two rings of heating elements, each element having two neighbouring elements in circumferential direction and, in addition, at least one neighbouring element in radial direction.

52. The feature in question uses the expression "in each case" without defining, which "case" is meant. This renders the feature ambiguous:

(a) In a first understanding, "each case" refers to each two neighbouring heating elements, such that the feature means that each two neighbouring heating elements are serially connected via a connection portion. The subject-matter of claim 1, therefore, includes connections from one heating element to more than two neighbouring heating elements. Such subject-matter, however, is not disclosed in the application as filed.

(b) In a second understanding, "each case" refers to each of the unit heating elements, such that the feature means that each of the unit heating elements is serially connected to a neighbouring unit heating element via a connection portion.

53. The fact that there are two possible understandings renders the claim unclear (Article 84 EPC); and one of these understandings also introduces subject-matter that extends beyond the application as filed (Article 123(2) EPC).

54. For these reasons, Auxiliary Request 4a is also not allowable.

Auxiliary Requests 4a and 4b - inventive step

55. It was established with regard to Auxiliary Request 3a that the skilled person would have used the teaching of D5 to substitute the curve portions, each of which connects two neighbouring of the radially aligned plurality of unit heating elements in Figure 29 of D6, with non-heating connection portions. The resulting heater falls under the definition of each of claims 1 of Auxiliary Requests 4a and 4b. Their subject-matter does consequently not involve an inventive step for the same reasons as the subject-matter of claim 1 of Auxiliary Request 3a.

56. Hence, Auxiliary Requests 4a and 4b are likewise not allowable.

Auxiliary Request 4c - consideration

57. The proprietor filed Auxiliary Request 4c during the oral proceedings before the Board.

58. According to Article 13(2) RPBA 2020, requests submitted at this stage "shall, in principle, not be taken into account unless there are exceptional circumstances, which have been justified by cogent reasons".

59. According to the proprietor, the problems related to the definition of the invention, as well as the understanding of the objections, has become much clearer from the discussion of the objections against the higher-ranking requests during the oral proceedings. Therefore, it would only be fair to give the proprietor the chance to react to this new

development and give them the chance to fix the outstanding problems.

60. However, this does not constitute exceptional circumstances. All objections against the Main Request and Auxiliary Requests 1, 2, 3, and 3a that were discussed during oral proceedings had also been discussed in the previous written proceedings in a way that should have enabled the proprietor to understand the respective arguments. Hence, there was no fresh matter raised during oral proceedings that might have contributed to exceptional circumstances.

61. In the absence of exceptional circumstances Auxiliary Request 4c is not taken into account.

Auxiliary Requests 5 to 11 - allowability

62. It was established with regard to Auxiliary Request 3a that the skilled person would have used the teaching of D5 to substitute the curve portions of the meandering heating track in Figure 29 of D6 with conductive bridges. These bridges are non-heating connection portions that each serially connect two neighbouring of the radially aligned, bar-shaped unit heating elements 29. Thereby, the outer bridges form an outer circumference of the first heating portion.

63. Hence, the features added to claim 1 of each of Auxiliary Requests 5, 6, and 7 cannot contribute to an inventive step, and their subject-matter also lacks an inventive step for the same reason as claim 1 of Auxiliary Request 3a.

64. Claim 1 of each of Auxiliary Requests 6, 8, 9 and 11 comprises the same feature that was also added to claim 1 of Auxiliary Request 3. However, also this feature introduces added subject-matter, as outlined above.

65. Claim 1 of each of Auxiliary Requests 7 and 10 comprises the same feature that was also added to claim 1 of Auxiliary Request 4. This feature introduces added subject-matter.

66. Regarding Auxiliary Requests 5 to 11, the proprietor did not put forward any arguments further than those regarding the higher-ranking requests.

67. As a consequence, Auxiliary Requests 5 to 11 are not allowable for lack of inventive step (Articles 52(1) and 56 EPC), or added subject-matter (Article 123(2) EPC), or both.

Remittal

68. The requirements for the proprietor's conditional request that the case be remitted if the Board intended a revocation of the patent based on grounds of opposition not discussed during opposition proceedings, are not met. All objections against the above claim requests are based on grounds of opposition (added subject-matter, novelty, and inventive step) that had been discussed during the opposition proceedings. The clarity objection against Auxiliary Request 4a is not a new ground of opposition, but merely the examination of the amendments for conformity with the EPC (see G 3/14).

69. Hence, there is no room or need for remittal of the case.

Conclusions

70. The Main Request is not allowable, because claim 1 extends beyond the content of the application as filed.

71. Auxiliary Request 1 is not allowable, because the subject-matter of claim 1 is not novel.

72. Auxiliary Request 2 is not allowable, because the subject-matter of claim 1 is not novel.

73. Auxiliary Request 3 is not allowable, because the subject-matter of claim 1 extends beyond the content of the application as filed, and is not novel.

74. Auxiliary Request 3a is not allowable, because the subject-matter of claim 1 does not involve an inventive step.

75. Auxiliary Request 4 is not allowable, because the subject-matter of claim 1 extends beyond the content of the application as filed, and does not involve an inventive step.

76. Auxiliary Requests 4a is not allowable, because claim 1 is not clear, and because the subject-matter of claim 1 extends beyond the content of the application as filed and does not involve an inventive step.

77. Auxiliary Requests 4b is not allowable, because the subject-matter of claim 1 does not involve an inventive step.

78. Auxiliary Request 4c is not considered (Article 13(2) RPBA 2020).

79. Auxiliary Requests 5 to 11 are not allowable, because the respective subject-matters of claims 1 do not involve an inventive step, or extend beyond the content of the application as filed, or both.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chair:

D. Meyfarth T. Zinke

Decision electronically authenticated