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D E C I S I O N
of 8 February 1994

Case Number: T 0068/91 - 3.2.3

Application Number: 86105279.3

Publication Number: 0200100

IPC: F24C 7/06, H05B 6/80

Language of the proceedings: EN

Title of invention:
Heat cooking apparatus

Applicant:
Matsushita Electric Industrial Co., Ltd.

Opponent:
-

Headword:
-

Relevant legal norms:
EPC Art. 56

Keyword:
"Inventive step (yes, after amendment)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0068/91 - 3.2.3

D E C I S I O N
of the Technical Board of Appeal 3.2.3
of 8 February 1994

Appellant: Matsushita Electric Industrial Co., Ltd.
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Decision under appeal: **Decision of the Examining Division of the European Patent Office dated 20 August 1990 refusing European patent application No. 86 105 279.3 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: C.T. Wilson
Members: H. Andrä
W. Moser

Summary of Facts and Submissions

I. European patent application No. 86 105 279.3, filed on 16 April 1986, was refused by a decision of the Examining Division dated 20 August 1990. The decision was based on Claim 1 filed with a letter dated 18 January 1990 and Claims 2 to 6 filed with a letter dated 28 February 1989.

II. The reason given for the refusal was that the subject-matter of Claim 1 lacked an inventive step in the light of the prior art disclosed in US-A-4 455 319 and on page 1 of the description of the application.

III. On 22 October 1990, the Appellant (Applicant) filed a notice of appeal against that decision paying the appeal fee on the same day. The Statement of Grounds of Appeal was filed on 17 December 1990, with which new documents comprising Claims 1 to 5, pages 1 to 12 of the description and Figures 1 to 9 of the drawings were submitted.

IV. In a communication pursuant to Article 11(2) RPBA dated 5 August 1993 the Board expressed doubts as to whether Claim 1 could be considered to meet the requirements of Article 52(1) in combination with Article 56 EPC when considering the prior art cooking apparatus as acknowledged by the Appellant in the introductory part of the original description and the disclosure of US-A-4 455 319.

V. At the oral proceedings held on 8 February 1994, the Appellant presented two amended sets of claims according to a main request and an auxiliary request, respectively. He also contended that:

- starting out from the prior art cooking apparatus according to Figures 1 and 2 of the drawings of the application the skilled person realises that for solving the inherent problem of the invention he cannot combine the above-cited prior art with that shown in US-A-4 455 319 since according to the latter the metal wall is provided inside of the heater unit whereas the former prior art discloses the arrangement of the metal wall outside of the heater unit

- moreover, US-A-4 455 319 does not require metal walls tightly connected with each other as it does not concern a microwave heater but a long wavelength radiation oven

- even if the skilled person tried to adapt the radiator panel according to US-A-4 455 319 such that it provides metal walls tightly connected with each other he would risk causing damage to the heater since the known radiator panel is fitted as a separate, completely assembled unit. Due to this different concept, the known radiator panel can also not suggest the flat heater unit being releasably mounted as a separate unit outside one metal wall.

The Appellant requested to grant a patent based upon the set of claims according to the main request or according to the auxiliary request submitted during oral proceedings.

VI. Claim 1 according to the main request reads as follows:

"A heat cooking apparatus using electric resistance heat and microwave heat in combination, comprising:

a heating chamber (16) for accommodating food material (24a) to be heated therein and having its metal walls tightly connected with each other to form, together with a front door (12), a hermetically closed microwave-shielding heating chamber (16);
the heating chamber (16) having a microwave supply opening (23) for introducing microwaves into the heating chamber;
a flat heater unit (18) releasably mounted as a separate unit outside one metal wall (17, 36, 41) of the heating chamber (16) and covering substantially the whole outside surface of this metal wall, the flat heater unit having a resistance heater (29) separated from said one metal wall (17, 36, 41) by a heat-resistant electric insulator (32); and
a non-metallic highly heat emissive layer (37, 40, 44) coated on the inner surface of said one metal wall (17, 36, 41) of the heating chamber (16)."

Reasons for the Decision

The appeal complies with the requirements of Articles 106 to 108 and Rule 64 EPC and is admissible.

Main Request

1. *Amendments (Article 123(2) EPC)*

1.1 Claim 1 is based essentially on originally filed Claim 1. Obviously, the term "non-magnetic layer" in original Claim 1 is erroneous and should read "non-metallic layer" (cf. original Claim 3), a non-magnetic layer not being referred to in the original description.

The features starting in line 4 of Claim 1 with "... and having its metal walls ..." and ending with the last line of Claim 1 are disclosed on page 6, line 9 to page 9, line 10 of the original description in combination with Figures 5 and 7 to 10 of the original drawings. In particular, the feature newly introduced into Claim 1 that the flat heater unit (18) is releasably mounted as a separate unit outside one metal wall (17, 36, 41) of the heating chamber (16), derives from page 7, paragraph 1 of the original description in combination with the above-cited figures of the drawings.

1.2 The features of Claim 2 derive from Figures 8 and 9 of the original drawings and page 7, last paragraph to page 8, paragraphs 1 and 2 of the original description. Claims 3 and 5 are supported by the corresponding original claims and the feature of Claim 4 derives from the original Claim 4 in connection with Figure 10 of the original drawings.

1.3 As a result of the foregoing, Claims 1 to 5 are not objectionable under Article 123(2) EPC.

2. *Novelty (Article 54 EPC)*

Having examined all the documents covered by the European search report, the Board is satisfied that none of them discloses a heat cooking apparatus using electric resistance heat and microwave heat in combination comprising all the features recited in Claim 1.

The subject-matter of Claim 1 is therefore deemed to be novel in the sense of Article 54 EPC.

3. *Inventive step (Article 56 EPC)*

3.1 The first instance based its decision mainly on the prior art described by US-A-4 455 319 which was considered to reflect the relevant prior art. Since this document (cf. Claims 1 and 2) does not deal with microwave heating but concerns exclusively long wavelength radiation cooking, the Board is of the opinion that the prior art as acknowledged by the Appellant in the introductory part of the description and shown in Figures 1 and 2 of the drawings constitutes the state of the art closest to the subject-matter of the application as it concerns a heat cooking apparatus using electric resistance heat and microwave heat in combination in which the basic problem of shielding microwaves from passing out of the oven has been solved.

This known apparatus comprises a heating chamber for accommodating food material to be heated therein and having its metal walls tightly connected with each other to form, together with a front door, a hermetically closed microwave-shielding heating chamber, the heating chamber having a microwave supply opening for introducing microwaves into the heating chamber, a resistance heater being arranged near one of the metal walls of the heating chamber, i.e. inside of the corresponding metal wall.

3.2 In accordance with the arguments put forward by the Appellant, the afore-mentioned cooking apparatus has the disadvantage that the usable volume within the heating chamber is restricted, the cleaning of the oven is difficult since scattered food could be spread behind and onto the heater and the food is heated rather unevenly, i.e. the food could receive a heating pattern in the shape of the heater.

The object underlying the subject-matter of Claim 1 is therefore seen in providing a heat cooking apparatus using radiant heat and microwave heat in a combination which offers a large volume heating chamber, is easy to clean and to mount, and provides high-performance cooking together with uniform heat distribution.

By providing a flat heater unit mounted outside of the heating chamber metal wall the heating chamber volume can be utilised completely for accommodating food to be cooked. As the heating chamber thus obtained is unobstructed by any heater, it is easy to clean. The features that the flat heater unit covers substantially the whole outside surface of the heating chamber metal wall, that the heater is separated from the metal wall by a heat-resistant insulator and that a non-metallic, highly heat-emissive layer coated on the inner surface of the metal wall is provided, lead to a high-performance cooking and a uniform heat distribution in the chamber. Furthermore, due to releasably mounting the flat heater as a separate unit, maintenance and repair of the cooking apparatus is facilitated. Thus, the inherent problem is completely solved by the subject-matter of Claim 1.

3.3 In search of solutions to the underlying problem, the person skilled in the art may come across US-A-4 455 319 referred to in above section 3.1.

This citation describes a heat cooking apparatus using radiant heat and comprising:

a heat chamber (24) for accommodating food to be heated therein and having metal walls (84) defining the heating chamber, a flat heater unit having a resistance heater (resistive heating element 88) mounted outside of the corresponding metal wall (84) of the heating chamber and

covering substantially the whole outside surface thereof, the flat heater unit being separated from the metal wall by a heat-resistant electric insulator (86); and a non-metallic highly heat-emissive layer (92) coated on the inner surface of the respective metal wall (84) of the heating chamber.

As already outlined above, this cooking apparatus does not provide microwave heating but operates exclusively on the principle of long wavelength radiation. It does not, therefore, comprise metal walls tightly connected with each other to form, together with a front door, a hermetically closed microwave-shielding heating chamber. There is provided a radiator panel consisting of the heating element, a steel sheet, the heat-resistant electric insulator and the non-metallic, highly heat-emissive layer coated on the steel sheet, these layers forming an integrated sandwich construction.

A series of tabs provided along the periphery of the integrated radiator panel serve the purpose of mounting the latter with other components of the oven. The tabs consisting usually of metal are provided such as to minimise conductive heat transfer to the side walls (cf. column 5, lines 1 to 9 of the citation).

Thus, US-A-4 455 319 teaches the skilled person to use a particular type of connection of the metal plates constituting adjacent walls of the heating chamber for reasons of minimising heat transfer therebetween.

In the view of the Board, such a teaching would lead the skilled person away from the idea of substituting the radiator panel shown in US-A-4 455 319 for the metal wall-heater unit described in the prior art indicated in the application since such substitution would lead him in a different direction, namely to the concept of

minimising the contact area between neighbouring chamber walls. With heating devices using electric resistance heat and microwave heat in combination according to Claim 1, however, an intimate and tight connection of adjacent walls is indispensable for reason of preventing the microwave radiation from escaping from the cooking apparatus.

3.4 Should the skilled person nevertheless envisage making use of the teaching of US-A-4 455 319, he would see immediately that he could not solve the object of arriving at a combined heat cooking apparatus which is easy to mount, i.e. assemble. In the radiator panel of the above-said cooking apparatus, the resistance heater is integrated in a sandwich construction composed of a number of layers so that the problem of an easy mounting of the cooking apparatus is not tackled. Any access to the resistance heater would require at least the partial destruction of the integrated radiator panel. There is no hint in the citation to the flat heater being releasably mounted as a separate unit, in particular in the context with adjacent metal walls being tightly connected with each other, so that also a combination of the teaching of US-A-4 455 319 with the known combined cooking apparatus as indicated in the introductory part of the application would not allow the person skilled in the art to arrive in an obvious manner at the subject-matter of Claim 1.

3.5 The further documents recited in the European search report are all more remote from the claimed cooking apparatus. The Board is satisfied that none of these citations contains a lead to adapt the cooking apparatus according to the above-indicated relevant prior art such as to include all the features of Claim 1.

3.6 It follows from the above considerations that the subject-matter of Claim 1 is regarded as involving an inventive step (Article 56 EPC). Claim 1 is therefore acceptable under Article 52(1) EPC. The same result applies to the dependent Claims 2 to 5 which concern particular embodiments of the subject-matter according to Claim 1.

4. The description complies with the requirements of Rule 27(1)(a) to (f) EPC and is therefore suitable for the grant of the patent. However, on page 1, penultimate line of the description, the amendment from "... resistant heater ..." to "... resistance heater ..." is required. This amendment has been carried out by the Board at the request of the Appellant submitted by telefax of 25 March 1994.

Auxiliary request

Since the main request has been allowed, it is not necessary for the Board to consider the auxiliary request.

Order

For these reasons, it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to grant a patent on the basis of the documents according to the main request submitted during oral

proceedings, and with the correction indicated under point 4 above.

The Registrar: The Chairman:

N. Maslin C.T. Wilson