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D E C I S I O N
of 5 May 1999

Case Number: T 0971/97 - 3.5.1

Application Number: 93307310.8

Publication Number: 0588633

IPC: G05D 23/24

Language of the proceedings: EN

Title of invention:
Temperature control apparatus

Applicant:
Sanyo Electric Co., Ltd.

Opponent:
-

Headword:
Temperature control apparatus/TOKIZAKI

Relevant legal provisions:
EPC Art. 52(1), 56, 113(1)
EPC R. 67

Keyword:
"Inventive step (no)"
"Procedural violation (no)"
"No refund"

Decisions cited:
-

Catchword:

-

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Case Number: T 0971/97 - 3.5.1

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 5 May 1999

Appellant: Sanyo Electric Co., Ltd.
2-18, Keihan-Hondori
Moriguchi-shi, Osaka (JP)

Representative: Read, Matthew Charles
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 16 June 1997 refusing European patent application No. 93 307 310.8 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: P. K. J. van den Berg
Members: R. Randes
V. Di Cerbo

Summary of Facts and Submissions

I. This appeal is against the decision of the examining division to refuse European patent application No. 93 307 310.8.

II. In their first communication of 18 October 1995, the examining division argued that the claims lacked novelty over D1. In a reply, the applicant clarified the claims, restricted claim 1 to an air-conditioning apparatus and cast it in the two-part form based on D3. In the further communication of 3 April 1996, the examining division argued that the amended claims lacked inventive step in the light of D3 and the skilled person's common general knowledge in the art. In a reply the applicant amended claim 1 to define that the apparatus performed both heating and cooling functions and made an auxiliary request for oral proceedings. In the summons to oral proceedings the examining division maintained their negative view and stated that D1 disclosed using a single thermistor. The applicant filed a reply containing minor amendments. Subsequently, the applicant filed a letter stating that he did not wish to attend the oral proceedings.

III. At the oral proceedings which were held in the applicant's absence, the application was refused on the ground that the subject-matter of claims 1 to 4 lacked an inventive step (Articles 52(1) and 56 EPC). Inter alia the following documents were cited in the decision:

D1: US-A-4 755 958

D3: DE-A-3 036 298

D3 was the only document mentioned in the reasons for the decision. The reasoning that led to the decision was the following: the skilled person knew that thermistors were non-linear and so, despite the use of the word proportional in D3, the system would have had a temperature dependent sensitivity. It would therefore have been obvious to linearize the characteristic throughout the heating and cooling range as claimed in claim 1. Claims 2 and 3 were said to be normal practice and claim 4 to be known from D3.

IV. The appellant (applicant) filed a notice of appeal and grounds of appeal, both received 13 August 1997, and paid the prescribed fee. He requested that the decision under appeal be set aside and a patent be granted on the basis of the application as specified in the decision under appeal. The appellant also requested refund of the appeal fee. Finally, oral proceedings were requested.

V. Oral proceedings were appointed for 5 May 1999. In the communication accompanying the summons the rapporteur stated that the examining division had already communicated the essential reasoning of the refusal in the communication of 3 April 1996. The subsequent amendment relating to heating and cooling apparently had not changed the division's opinion as could be seen from the negative tone of the summons to oral proceedings. The final amendment relating to controlling the apparatus appeared to be merely a clarification. Furthermore the rapporteur referred to the prior art solutions for overcoming the problem of

using a single thermistor over a wide temperature range by using many thermistors, or by using a look up table as in D1. Finally, the rapporteur stated that the use of a calculating means appeared to be an obvious implementation. With a letter received 3 April 1999, the appellant, without commenting on the communication, stated that he had been instructed by the applicants not to attend oral proceedings.

VI. Oral proceedings before the Board were held on 5 May 1999 in the appellant's absence.

VII. Claim 1 reads as follows:

"An air-conditioning apparatus for both heating and cooling, including a temperature detection device (21) that presents an impedance characteristic having a value that varies in a non-linear manner as a function of detected temperature,
an analogue-to-digital converter (14) for digitizing the output of the temperature detection device and control means (14) for controlling the apparatus in dependence on the output of the analogue-to-digital converter,
characterized in that
the control means comprises a processing means (14) arranged to calculate a temperature value from the digitized output of the temperature detection device, according to a predetermined function based on said impedance characteristic, throughout the heating and cooling range of the apparatus, and controls the apparatus in dependence on the calculated temperature value."

VIII. The appellant argued as follows:

The decision under appeal was made in contravention of Article 113(1) EPC. The reasons given in the examining division's communication of 3 April 1996 were that linearization *per se* was obvious and using a new technique did not solve a further problem. The reasons given in the decision under appeal were that the calculation of corrected values was directly obvious from D3 and the skilled person's common knowledge. This ground had not been clearly communicated to the applicant, but was raised for the first time at the oral proceedings which the applicant did not attend. If the examining division's assertion about the skilled person in the decision under appeal was treated as "evidence", then new evidence had been presented at the oral proceedings and accordingly the decision was contrary to Article 113(1) EPC (see G 4/92). If the examining division's assertion was not considered as "evidence", then it should not have been used to refuse the application.

The decision was made in contravention of Article 56 EPC in that it was not made "having regard to the state of the art". In particular, the examining division incorrectly identified in D3 the feature of calculating a temperature value from the output of the A/D converter according to a predetermined function. In addition, the examining division did not apply the established legal principles for determining whether an invention lacked inventive step. In particular, they did not properly identify the closest prior art and they followed a line of reasoning dictated solely by the need to arrive ex post facto at the invention

without regard to the realities of the field of the invention.

The invention related to a problem arising in air-conditioning apparatus having both heating and cooling functions. This type of apparatus must sense temperatures over a wider range than apparatus having only, for instance, a cooling function. The large temperature range meant that a single thermistor did not produce a linear output over the whole operating range. A prior art solution to this problem was to use two thermistors for different temperature sub-ranges. The invention provided an alternative solution which was to calculate a corrected temperature value using the output from an A/D converter and a linearizing function. The apparatus in D3 did not have both heating and cooling functions and so the problem did not arise. In fact, D3 referred to the temperature signal as being proportional to temperature. The invention would therefore not have been obvious to the skilled person.

Reasons for the Decision

1. The appeal is admissible.

2. *Procedural violation*

2.1 The Board is of the opinion, foreshadowed in the Board's communication, that the decision did not contravene Article 113(1) EPC. Despite the terse nature of the examining division's reasoning, it remains the case that the communication of 3 April 1996 contained, in particular, the ground that the appellant maintains

was not communicated to him, namely that the calculation of corrected values was directly obvious from D3 and the skilled person's common knowledge. The Board is therefore of the opinion that no new grounds or evidence in the sense of Article 113(1) were added in the decision.

2.2 Regarding the appellant's further allegation, the Board considers that an assessment of prior art is a substantive issue and not a procedural one.

2.3 The Board is accordingly of the opinion that there has been no procedural violation.

3. *Inventive step*

3.1 The application relates to temperature measurement using a non-linear detection device such as a thermistor in an air-conditioning apparatus capable of both heating and cooling.

3.2 The Board considers that the subject-matter of claim 1 differs from that of D3 essentially in that the control means comprises a processing means for compensating the digitized temperature value for the non-linear device characteristic throughout the heating and cooling range of the apparatus. The control means also controls the apparatus in dependence on the calculated temperature value.

3.3 The Board agrees with the examining division that this difference does not involve an inventive step. This is evidenced by D1 which was almost the sole subject of the examining division's communication of 18 October

1995. The skilled person would have undoubtably consulted D1 which is in the field of temperature measurement (classified in G01K - "Measuring Temperature"). In its introduction, D1 discusses the problem of measuring temperature using a single non-linear device such as a thermistor. The skilled person would have recognised that any solution provided in this document could be applied to any system using such a non-linear temperature sensing element. D1 states that the conventional potential divider arrangement of the device is not adequate, especially over a wide temperature range. It further proposes converting the digitised temperature value into a corrected value using a memory table (see Figure 4). It is implicit that this memory table contains values of the claimed predetermined function based on the device characteristic.

3.4 The Board is of the opinion, alluded to in its communication, that the distinction between performing the correction using a look-up table as in D1 and a calculation as claimed does not involve an inventive step. Firstly, the use of a look-up table and its associated control circuit can be considered to be an example of a "calculation" (a black box containing a microprocessor and a look-up table would function as a "calculating" means). Secondly, even if this distinction is regarded as implying a difference, these alternative implementations are considered as notoriously interchangeable in the field of microprocessor control systems and therefore to be considered as obvious equivalents; the choice being based on the speed of the processor as implied in the Board's communication, for example.

3.5 Finally, the Board is of the opinion that it is self-evident that, when the control means is implemented with a microprocessor, as it is in D3, it should comprise the processing means which performs the linearizing function. It is also self-evident that the control means should control the apparatus in dependence on the calculated temperature value.

3.6 The subject-matter of claim 1 accordingly does not involve an inventive step having regard to the prior art described in D3 and D1.

3.7 The Board agrees with the examining division's assessment of claims 2 to 4.

4. The appeal must therefore be dismissed. Accordingly, the request for refund of the appeal fee is refused since the requirements given in Rule 67 EPC are not fulfilled.

Order

For these reasons it is decided that:

1. The appeal is dismissed.

The Registrar: The Chairman:

M. Kiehl P. K. J. van den Berg