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D E C I S I O N
of 18 June 1997

Case Number: T 0328/95 - 3.5.2

Application Number: 87302878.1

Publication Number: 0241219

IPC: G04C 10/00

Language of the proceedings: EN

Title of invention:
Electronic timepiece

Patentee:
SEIKO INSTRUMENTS INC.

Opponent:
Junghans Uhren GmbH

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - (yes)"

Decisions cited:
-

Catchword:
-

Case Number: T 0328/95 - 3.5.2

D E C I S I O N
of the Technical Board of Appeal 3.5.2
of 18 June 1997

Appellant: (Opponent)
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Respondent: (Proprietor of the patent)
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Decision under appeal:
Decision of the Opposition Division of the European Patent Office posted 17 March 1995 rejecting the opposition filed against European patent No. 0 241 219 pursuant to Article 102(2) EPC.

Composition of the Board:

Chairman: W. J. L. Wheeler
Members: R. G. O'Connell
A. C. G. Lindqvist

Summary of Facts and Submissions

I. The appellant (opponent) contests the decision of the opposition division rejecting its opposition to European patent No. EP 0 241 219.

II. The patent has not been amended. Claim 1 reads as follows:

"1. An electronic timepiece comprising: oscillator means (1) for generating a time base signal; frequency dividing means (2) for frequency dividing the time base signal; pulse synthesising circuit means (3) for producing a plurality of control signals in response to a signal from said frequency dividing means (2); a step motor driving means (5) for generating and controlling driving pulses for a step motor (10) in response to the control signals of said pulse synthesising circuit means (3); power supply means (9) for generating, storing and supplying electric energy which includes a primary power source for generating electric energy, and a secondary power source (C1,C2) for storing said electric energy and comprising a first capacitor (C1) having a relatively large capacitance, and a second capacitor (C2) having a relatively small capacitance; voltage detecting means (4) for detecting a plurality of voltage levels of said power supply means (9); and charge control means (6) for controlling storage and supply of electric energy in and from said power supply means in response to the result of detection of said voltage detecting means (4) characterised in that said voltage detecting means (4) comprises a sampling signal selecting circuit (12) for producing sampling signals of different periods depending upon the result of voltage detection, and a plurality of voltage detectors (25) for detecting a plurality of voltage levels of said first capacitor (C1) and said second capacitor (C2), respectively."

Claims 2 to 6 are dependent on claim 1.

III. In the notice of opposition the opponent requested

revocation of the patent in its entirety on the grounds that the subject-matter of the claims of the patent did not involve an inventive step.

IV. The following documents featured in the decision under appeal and were referred to in the appeal proceedings:

D1: GB-A-2 158 274

D2: DE-C3-2 518 038

D3: XIe CONGRES INTERNATIONAL DE CHRONOMETRIE, Besançon, 4 to 6 October 1984, vol. 1, pages 75 to 79; T. Yamada: "No battery" analog quartz watch.

On appeal the opponent (appellant) submitted the following additional documents:

D5: Markt & Technik No.1, 7 January 1983, page 78, "Speicherschutz: Elko ersetzt Akkus"

D6: Unterlagen Erstes Statusseminar "Solare Großuhren", Fraunhofer-Institut für Solare Energiesysteme (Freiburg), 22 January 1986; Chapter 3 and list of participants.

D7: GB-A-2 159 351

D8: CH-A-632 384 G.

V. The respondent did not object to the documents D5 to D8 being taken into consideration and at oral proceedings the board exercised its discretion under Article 114 EPC to admit these documents (cf point 2 below).

VI. The appellant(opponent) argued essentially as follows:

D7 was the closest prior art. The applicant of D7 was a Seiko company, namely Seiko Instrument & Electronics

Ltd., and the reputation of Seiko was such that a person skilled in the design of electronic watches would assume that D7 related to electronic watches irrespective of the fact that the D7 circuit could be used also for e.g. electronic calculators. The circuit load 7 in Figure 1 would accordingly be interpreted by the person skilled in the art as an electronic watch circuit implicitly comprising the conventional features of such a circuit as recited in the first eleven lines of claim 1 of the opposed patent (column 10, line 51 to column 11, line 3 of the published patent specification). In addition D7 disclosed all the remaining features of the claim apart from "a sampling signal selecting circuit (12) for producing sampling signals of different periods depending upon the result of voltage detection". In particular it disclosed "a plurality of voltage detectors for detecting a plurality of voltage levels of said first capacitor and said second capacitor respectively." Although D7, Figure 3 depicted circuitry which sampled and detected only a single voltage level of the large capacitor at point *a*, this was simply a particular embodiment; it could be seen from Figure 2, upper and lower parts, that D7 also envisaged the monitoring of a plurality of voltage levels on both capacitors. For these reasons D7 was to be regarded as the closest prior art, in particular it was closer than D1 in that it disclosed more of the features of claim 1.

Although D7 was silent about sampling signals of different periods, it was obvious to the person skilled in the art that for reasons of energy economy the voltage levels for the large capacity should be sampled

with long time intervals between successive samplings whereas the small capacity was critical and required short sampling intervals. Moreover D2, also originating from a Seiko company, taught such a variation of the sampling frequency - see column 7, line 19 in combination with lines 43 and 48 - for monitoring battery voltage in an electronic timepiece. The fact that this teaching of D2 would be regarded by the skilled person as applicable to the monitoring of capacitor voltage was derivable from D7 itself, page 1, lines 31 to 37 in combination with line 50; this argument was reinforced by the common general knowledge in the art of powering electronic timepieces summarised in D3, Table I, which documented the development trend in energy stores from primary batteries through to primary, eg solar, sources combined with rechargeable batteries or capacitors.

Thus all features of claim 1 of the opposed patent were known from D7 apart from the adaptation of the sampling rate in accordance with the sensed voltage. The skilled person would, however, be led to adopt the latter measure, without an inventive step being involved, by a study of D2 which taught this measure as a solution to a closely analogous problem.

Alternatively, the skilled person, starting from D7, would be led to the claimed solution by a study of D8, which taught the use of energy-saving non-continuous "preferably periodic" monitoring of the voltage of a rechargeable battery in a wristwatch. The qualification "preferably" would lead the skilled person to consider the potential advantages of non-continuous non-periodic

sampling and thus arrive at the idea of a voltage dependent sampling period which could be adapted to the relevant voltage decay characteristic.

VII. The respondent's arguments can be summarized as follows:

D1 was considered to be the closest prior art showing a capacitor-powered timepiece corresponding to the preamble of claim 1; D7 was no more relevant than D1. The respondent agreed that D7 had some similarity with the prior art portion of claim 1 and pointed out that D7 and the opposed patent had a common inventor. This fact and the later priority date of the opposed patent (2 years) could be correlated with the more sophisticated and complete solution presented in the opposed patent. The second characterizing feature of claim 1, which required that a plurality of voltage levels of the first capacitor and a plurality of voltage levels of the second capacitor be sensed, could not be found in D7; Figure 3 of D7 disclosed a less sophisticated voltage sensing where a single voltage level of the first capacitor was sensed in contrast with three voltage levels of the second capacitor. Explicit disclosure of sampling or of switching between different sampling frequencies had not been proven by the appellant; D2 only disclosed a single sampling frequency which was adapted to the application, ie the continual measurement of a voltage of a battery. The impression of switching between different sampling frequencies was arbitrarily forced by the combination of independent parts of the description in D2. In addition, D2 did not relate to nor suggest an application to a rechargeable battery, let alone a capacitor.

VIII. The appellant requested that the decision under appeal

be set aside and that the patent be revoked.

IX. The respondent requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

2. *Documents introduced on appeal*

In view of the fact that the respondent has not objected to the introduction of the documents D5 to D8, has not requested remittal of the case to the opposition division for consideration of these documents, and has commented substantively on the appellant's arguments based on them, the board sees no reason to exercise its discretion under Article 114(2) EPC to disregard these documents.

3. *The single issue in this appeal is inventive step*

4. *Closest prior art and problem underlying the present invention*

According to the appellant, the difference between the timepiece specified in claim 1 and that known from D7 consists solely of the second characterising feature of the claim, viz: "a sampling signal selecting circuit for producing sampling signals of different periods depending upon the result of voltage detection".

Assuming, without deciding, that the appellant's interpretation of D7 is correct, the relevant technical problem, starting from this prior art, would be to design a more power efficient circuit for controlling the charging and discharging of the capacitors of the secondary power source. This problem represents a routine consideration for a circuit designer so that its formulation does not, of itself, involve a contribution to inventive step.

5. *Appellant's argument that the solution claimed is obvious*

It appears plausible to the board that the skilled person addressing this problem would consider D2 since it discusses the choice of sampling periods in monitoring the voltage level of the energy store - albeit a non-rechargeable battery - of an electronic timepiece. However, on the crucial issue of what conclusions the skilled person would draw from a study of D2, the board is not persuaded by the appellant's argument. The main thrust of the teaching of the relevant part of D2 (column 7, line 28 to column 9, line 11) is that continuous monitoring is unnecessary and therefore wasteful by virtue of the energy consumed in the measurement circuit. Accordingly it teaches that the battery voltage should be detected at regular intervals and that the sampling period should be set at a value appropriate to the expected battery life and its voltage decay characteristic. A period of one day is mentioned for one application (column 7, lines 42 to 44) and in another embodiment (column 8, lines 40 to 45) a period of two seconds is used. For each

application a **fixed** sampling period is unequivocally specified. There is no suggestion that the period should be variable and *a fortiori* no suggestion that the sampling period should depend upon the result of voltage detection. Hence, in the judgement of the board, the skilled person, addressing the problem specified above, would be led by a study of D2 to choose a fixed sampling period appropriate to the shortest decay time involved, viz, that of the smaller capacitor, as a solution to the problem. The appellant's contention that the skilled person would proceed to the refinement of "different periods depending on the result of voltage detection" is judged by the board to be an argument based on hindsight. The above reasoning also applies *mutatis mutandis* to the appellant's alternative argument based on a combination of D7 and D8. The latter document also teaches an energy-saving non-continuous monitoring which is described as "preferably periodic". The argument that the qualification "preferably" would provide a pointer for the skilled person in the direction of using "different periods depending on the result of voltage detection" is again, in the judgement of the board, based on hindsight.

6. Hence, even when D7 is interpreted on the basis of assumptions most favourable to the appellant's case the latter is judged not to have demonstrated that the subject matter of claim 1 of the opposed patent does not involve an inventive step within the meaning of Article 56 EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

M. Kiehl W. J. L. Wheeler