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D E C I S I O N
of 11 May 2000

Case Number: T 1123/97 - 3.5.2

Application Number: 88307913.9

Publication Number: 0305191

IPC: G11B 7/095

Language of the proceedings: EN

Title of invention:
Track servo control system for optical disk apparatus

Patentee:
Fujitsu Limited

Opponent:
Interessengemeinschaft für Rundfunkschutzrechte GmbH Schutzrechtsverwertung & Co. KG

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - yes"

Decisions cited:
-

Catchword:

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 1123/97 - 3.5.2

D E C I S I O N
of the Technical Board of Appeal 3.5.2
of 11 May 2000

Appellant: (Opponent)
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Representative:
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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 11 September 1997 rejecting the opposition filed against European patent No. 0 305 191 pursuant to Article 102(2) EPC.

Composition of the Board:

Chairman: W. J. L. Wheeler
Members: R. G. O'Connell
B. J. Schachenmann

Summary of Facts and Submissions

I. This appeal is against the rejection of the opposition to European patent No. 305 191.

II. In the notice of opposition the opponent (now appellant) had 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 having regard in particular to the following prior art documents:

D1: EP-A-0 095 766
D4: Patent Abstracts of Japan, vol. 7, no. 212 (P224) & JP-A-58 105 435
D5: EP-A-0 093 582.

III. The patent has not been amended. Claims 1 and 8, the independent apparatus and method claims respectively, read as follows:

"1. A track servo control system for an optical disk apparatus including a rotatable optical disk (1) on which a plurality of grooves for recording data are spirally formed along a direction of rotation of the optical disk (1), an optical head (2) which is movable in a radial direction across the optical disk and includes a light source (24) for emitting light, an intermediate optical system (23, 23a, 23b, 25a, 25b, 27) including a beam splitter (23a), an object lens (20) for focusing the light from the light source onto a groove of the disk (1) through the intermediate optical system and receiving light reflected from the groove, a track error sensor (26) for receiving the reflected light through the intermediate optical system

and outputting a track error signal (TES) in response to a deviation of the light incident on the groove from the center of the groove, and a track actuator (21) for moving the object lens in the radial direction, the servo control system comprising:

a servo pull-in detecting means (34a, 34b, 5), operatively connected to said track error sensor (26), for detecting completion of a servo pull-in operation in accordance with said track error signal (TES); and

a servo control means (33, 35, 5), having phase compensating means (35), operatively connected to said track error sensor (26) and said track actuator (21), for controlling said track actuator in response to said track error signal to position said object lens so that the light from said object lens is incident on the center of the groove; characterised in that said servo control means has a low servo control gain and a high servo control gain, the low servo control gain being selected by said servo pull-in detecting means during the servo pull-in operation, and the high servo control gain being selected by said servo pull-in detecting means after completion of the servo pull-in operation."

"8. A method for controlling a track servo control system according to claim 1, comprising the steps of:

locking-on said track actuator (21) to lock-on said track actuator at a restore position thereof just after completion of a seek operation;

selecting the low servo control gain of said servo control means (33, 35, 5);

energizing said servo control means to pull-in a servo control loop of said track actuator;

detecting the completion of the servo pull-in;

selecting the high servo control gain of said servo control means, after the completion of the servo

pull-in; and

releasing said lock-on of said track actuator."

IV. Oral proceedings were held before the board on 11 May 2000.

V. The opponent appellant argued essentially as follows:

Starting from the agreed closest prior art D4 the objective technical problem addressed by the opposed patent was to improve the pull-in speed and stability of the servo system of the optical disc player; cf opposed patent, column 1, lines 28-31. D1 disclosed a servo system which enabled the data on an optical disc to be stably reproduced independently of the variation of disc dimensions; cf D1, page 6, lines 2-5. It was accordingly obvious for the person skilled in the art to look to D1 for a solution to the problem addressed by the opposed patent since both were concerned with ensuring improved stability of the servo system.

In particular, Fig. 9 and associated description of D1 taught that after a disc has been inserted a certain servo gain should be set at the start of the servo pull-in process (Fig. 9, step 2) which gain was to be adjusted in small steps after the pull-in of the focus and tracking servo had been accomplished by either decreasing (steps 7, 8, 9) or increasing (steps 12, 13, 14) it until an optimum value had been reached; this was followed by an increase in gain by a predetermined amount (step 10 or 15).

In D1 (Fig. 9) servo pull-in must occur during steps 2 to 4 since it had to be substantially complete to enable data signals to be read and their error rate

determined in step 5. In steps 5 and 6 and 7 to 9 or 12 to 14 the servo gain was automatically adjusted to compensate for disc eccentricity and at the end of the process ie after completion of the servo pull-in, just as in claim 1 of the opposed patent, the servo gain was increased.

VI. The respondent proprietor argued essentially as follows:

The person skilled in the art would have no reason to combine D4 and D1. The opponent's assertion that both dealt with servo pull-in was incorrect.

D4 disclosed the switching ON/OFF of a high-pass filter before and after servo pull-in operation in order to solve a problem of fluctuation of DC bias in an optical detector. On the other hand, D1 did not deal with servo pull-in at all. Rather, it disclosed the adjustment of the gain during a reading operation in response to read errors, in order to automatically adjust the gain to provide stable reproduction. Accordingly, the purpose of these two prior art proposals was quite different from one another so that it was impossible to combine the citation of D4 with the citation D1 in a straightforward manner. However, for the sake of argument, even if the skilled person did attempt to combine these two items of prior art this would still not lead to the present invention as claimed.

As already pointed out at point 7 in the decision under appeal D1 concerned a completely different operation from servo pull-in, namely compensation for errors during a reading operation. Consequently, D1 completely failed to disclose or suggest the feature required by

claim 1 of the opposed patent, that the high servo control gain be "selected by said servo pull-in detecting means after completion of the servo pull-in operation". The only teaching of D1 regarding changing of the servo control gain, was that this was done by detecting whether read errors exceeded a certain threshold and then adjusting the gain accordingly (see Figure 9 of D1).

In principle, it was true that following the teaching of D1 could result in an initial gain being exceeded by a gain set later on during a reading operation, i.e. set at some time after completion of a servo pull-in operation. However, when considering the teaching of D1 to the skilled person at the priority date, what was more important was the explicit disclosure of the document. As noted at point 8 of the decision under appeal, D1 contained two examples (Figures 31 and 33) in which the "loop gain" (servo control gain) was shown to start at a low value, be raised to a higher value during "access", and then be reduced to the low value again during "normal playback" (i.e. a reading operation). If the setting of the loop gain in D1 had any relevance to the present invention, the teaching thereby given to the skilled person was that a high servo control gain should be selected during accessing of a track (including servo pull-in) and a low gain selected thereafter. As pointed out by the opposition division, that was the opposite of what was claimed in the patent.

VII. The appellant requested that the decision under appeal be set aside and that the patent be revoked.

VIII. The respondent requested that the appeal be dismissed.

Reasons for the Decision

1. The appeal is admissible.

2. *Novelty*

It is common ground that claim 1 of the opposed patent is properly delimited with respect to the closest prior art D4. Novelty is accordingly not disputed.

3. *Closest prior art and objective technical problem*

3.1 As acknowledged in the opposed patent at column 1, lines 35 to 40, the agreed closest prior art D4 discloses a track servo control system according to the preamble of claim 1; cf D4, Fig. 5 and abstract. In D4 the servo loop includes a phase compensating circuit 17 which enhances high frequency components of the track error signal (TES). Because of asymmetric clipping an unwanted DC component is generated in the TES signal which can prevent control of the pull-in; cf discussion in the opposed patent at column 6, line 50 to column 7, line 26 in connection with Figs 6 to 8b. In D4 a high-pass filter 19 is located upstream of the circuit 17 which filter is shuntable by a switch 20. In this way the undesirable DC component can be eliminated by the filter during the pull-in phase.

3.2 It is also common ground that starting from D4 the objective technical problem solved by the track servo control system of claim 1 is to achieve a faster pull-in without loss of stability in the servo system as indicated in the opposed patent at column 1, lines 28 to 31 and column 7, lines 27 to 31.

3.3 The solution for this problem taught in the opposed patent and specified in detail in claims 1 and 8 is to operate with a reduced amplification of the TES during the servo pull-in phase and with increased amplification thereafter; cf opposed patent column 7, lines 45 to 57.

4. *Inventive step*

4.1 In the procedure before the opposition division the opponent (now appellant) argued that the solution defined in claim 1 did not involve an inventive step having regard to either a combination of D4 and D5 or a combination of D4 and D1 although only the latter argument has been further developed on appeal. Nevertheless the appellant stated in the oral proceedings before the board that he also maintained the opposition based on the arguments adduced before the opposition division that the subject-matter of claim 1 of the opposed patent did not involve an inventive step having regard to a combination of D4 and D5.

4.2 Argument based on D4 and D5

In effect the appellant has not substantiated his appeal insofar as it relates to that part of the decision under appeal which relates to inventive step over the combination of D4 and D5. He has merely stated that he disagrees with the result without mentioning any specific aspect of the reasoning of the opposition division which he alleges not to be well founded. The board observes that the onus is on the appellant to point to some deficiency in the reasoning in the decision under appeal and this onus has not been

discharged by a simple expression of disagreement with the result. For its part the board sees no reason to disagree with the reasoning and finding of the opposition division in the relevant part of the decision under appeal and will not consider D5 further.

4.3 Argument based on D4 and D1

4.3.1 The parties are divided on whether the person skilled in the art starting from D4 and addressing the problem referred to at point 3.2 above would regard D1 as relevant in relation to this problem. In particular the respondent characterises the appellant’s assertion that both deal with the process of servo pull-in as "clearly incorrect". The board notes that although it is true that D1 does not disclose any details of the servo pull-in process as such and that it concentrates essentially on the setting of the servo amplifier gain after pull-in has been achieved, the same can be said of the opposed patent and in particular of the solution specified in claim 1. The last clause of the latter refers to "the high servo control gain being selected by said servo pull-in detecting means after completion of the servo pull-in operation" which does not exclude the possibility that a significant period of time may elapse between pull-in being established and detected and the high servo control gain being selected.

4.3.2 Hence the board agrees with the appellant’s contention that the person skilled in the art, starting from D4 and addressing the objective technical problem of the opposed patent, could derive from D1 the suggestion that in certain circumstances it is advantageous to increase the servo gain (from a previously set lower value) during the pulled-in phase. Given however that

other embodiments of D1 teach that in certain other circumstances it is advantageous to decrease the servo gain (from its previously set value), the board is not persuaded the person skilled in the art would derive from D1 as a whole and without the benefit of a hindsight inspired selection, the systematic teaching that the servo gain should be set to a low value during the pull-in operation and changed to a high value after completion of the servo pull-in operation.

4.3.3 Although there is undisputedly no question of D1 destroying the novelty of the subject-matter of claim 1 since *inter alia* it does not disclose a servo pull-in detecting means, from the point of view of assessing inventive step the disclosure in some embodiments of D1 of an increase in servo gain after completion of the servo pull-in operation is a kind of accidental anticipation of the characterising portion of claim 1 since in certain circumstances it does the same thing as the opposed patent on the basis of a criterion, namely data error rate, which plays no part in the teaching of the opposed patent.

5. The board therefore concludes that the appellant has not shown that either the track servo control system or the method of controlling the latter as specified in claims 1 and 8 of the opposed patent is obvious having regard to the cited prior art. Accordingly the ground of opposition pursuant to Article 100(a) EPC in combination with Articles 52(1) and 56 EPC does not prejudice the maintenance of the opposed patent in unamended form.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

M. Hörnell W. J. L. Wheeler