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Aktenzeichen / Case Number / N^o du recours : T 39/86

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Bezeichnung der Erfindung: Tracking system for a reading beam

Title of invention:

Titre de l'invention :

Klassifikation / Classification / Classement : G11 B 7/08

ENTSCHEIDUNG / DECISION

vom / of / du 6 April 1987

Anmelder / Applicant / Demandeur : DISCOVISION ASSOCIATES

Patentinhaber / Proprietor of the patent /

Titulaire du brevet :

Einsprechender / Opponent / Opposant :

Stichwort / Headword / Référence : Dimples/Discovision

EPÜ / EPC / CBE Article 56

Kennwort / Keyword / Mot clé : "Inventive step (no)"

Leitsatz / Headnote / Sommaire

Europäisches
Patentamt

Beschwerdekammern

European Patent
Office

Boards of Appeal

Office européen
des brevets

Chambres de recours



Case Number : T 39/86

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 6 April 1987

Appellant : DISCOVISION ASSOCIATES
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Decision under appeal : Decision of Examining Division 067
of the European Patent Office dated
dated 27 August 1985 refusing
patent application No. 82 301 608.4
pursuant to Article 97(1) EPC

Composition of the Board :

Chairman : P.K.J. Van den Berg

Member : W.J.L. Wheeler

Member : E. Persson

Summary of Facts and Submissions

- I. European patent application No. 82 301 608.4, filed on 26 March 1982 (publication No. 0 062 464), claiming priority from a prior application of 31 March 1981 (US 249 550), was refused by the decision of the Examining Division 067 of the European Patent Office dated 27 August 1985. That decision was based on Claims 1 to 6 filed on 11 July 1984.

The reason given for the refusal was that the subject-matter of the claims did not involve an inventive step having regard to the prior art disclosed in JP-A-5 538 686.

- II. The Appellant lodged an appeal against this decision on 25 October 1985. The appeal fee was paid on 24 October 1985. The Statement of Grounds was filed on 2 January 1986.

With the Statement of Grounds the Appellant filed new Claims 1 to 6, Claims 1 and 5 being independent claims which read as follows:

1. Tracking apparatus for aligning a scanning reading beam in a prescribed position relative to a selected recording track (37) on a record medium (13), comprising:

means (25) for determining the location of the reading beam relative to the selected track on the record medium, and for producing a corresponding tracking error signal;

beam steering means (21), responsive to the tracking error signal, for controllably positioning the reading beam in the prescribed position relative to the selected track;

threshold means (47, 49) for monitoring the tracking error signal and comparing it to prescribed thresholds to determine when the reading beam is scanning a record medium defect of a type that causes the selected track to deviate momentarily from its normal position, and for producing a corresponding disable signal of a fixed duration when a threshold is exceeded; and

means (43) responsive to the disable signal, for selectively uncoupling the tracking error signal from the beam steering means, characterised in that the fixed duration of the disable signal corresponds to the nominal duration of a defect of said type and the reading beam is maintained in its current position relative to the record medium, during the disable signal, such that the beam continues to follow the selected track after the defect is passed.

5. A method for aligning a scanning reading beam in a prescribed position relative to a selected recording track and a record medium, comprising steps of:

determining the location of the reading beam relative to the selected track on the record medium, and producing a corresponding tracking error signal;

controllably positioning the reading beam in accordance with the tracking error signal, to align the beam in the prescribed position relative to the selected track;

monitoring the tracking error signal and determining when the reading beam is scanning a record medium defect of a type that causes the selected track to deviate momentarily from its normal position, and producing a corresponding disable signal of a fixed duration; and

interrupting the step of controllably positioning, in response to the disable signal, characterised in that the fixed duration of the disable signal corresponds to the nominal duration of a defect of said type and the reading beam is maintained in its current position relative to the record medium during the disable signal, such that the beam continues to follow the selected track after the defect is passed.

- III. In the Statement of Grounds the Appellant argued that the subject-matter of these claims involved an inventive step over the cited prior art (JP-A-5 538 686). The essence of the argument was that the Japanese citation did not teach the feature of maintaining the reading beam in its current position during the opening of the tracking loop so that the beam would continue to follow the selected track after the defect had been passed. On the contrary, in accordance with the citation, when a defect was encountered the radial drive motor was driven for a fixed duration, which meant that all the tracks affected by the defect would be skipped.

The present invention was based on the recognition that in skipping a number of tracks valuable information was lost and that this could be avoided by disabling the tracking loop just for the duration of the defect (which was of a particular kind, called a dimple, whose duration was approximately known). The momentary opening of the tracking servo loop in the present invention caused the beam to remain in a fixed radial position so that it would be

centered directly over the same track after the deviated portion of the track had been passed. This allowed substantially all the information to be recovered from the disc.

The Japanese citation taught only a method to prevent the player from hanging up in a stop motion mode in which it repeatedly jumped back a track each time it reached the defect. This teaching went against maintaining the beam in its current position. The tracking loop was opened to facilitate moving the beam away from its current position (using the radial motor). No mention was made of the nature of the defect or of its length. There was no relationship between the time period that the tracking loop was open and the length of the defect. Circumferential defects in a disc were extremely rare and there was no indication that the Japanese citation was considering a circumferential defect extending half way round the disc. The length of time for which the tracking loop was open was not chosen to clear a defect in one track but to clear by skipping a number of adjacent tracks. If the Japanese prior art were modified by omitting the radial skip it would not solve the problem it set out to solve.

- IV. At the oral proceedings, requested by the Appellant, which took place on 6 April 1987, the Appellant confirmed that grant of a patent was requested on the basis of Claims 1 to 6 filed with the Statement of Grounds on 2 January 1986.

The Appellant explained that the Japanese citation was concerned with reading video discs, where it was conventional to record one video frame per revolution. With video signals it was acceptable (to the human eye) to miss out one or more frames. This was the only piece of prior art cited. It taught that when the tracking error signal

exceeded a threshold (in the presence of a defect whose nature was not specified) the radial adjustment motor should be driven to quickly bypass the affected track(s). To facilitate this, the tracking servo loop should be disabled for nearly half a revolution.

The present invention, on the other hand, was concerned not only with video information but also with digital sound or data information (cf. the description, page 1, first paragraph). With the latter two types of information it was not acceptable to skip tracks. The present inventors had done four things: (i) identified dimples as the source of the problem, (ii) realised that a dimple damaged a very small part of each of a large number of tracks, (iii) decided to by-pass the dimple (since track skipping is not acceptable for sound or data) and (iv) decided to disable the tracking loop for a very short period (100-200 μ sec). This appeared very simple, once it was known, but there was no evidence before the invention that (iv) was all that was necessary.

The first part of Claim 1 was based on the Japanese citation. The characterising part included three features: (i) the fixed duration corresponded to the nominal duration of a defect (about 1/100th of the fixed duration in the Japanese citation), (ii) the beam was maintained in its current position and (iii) as a consequence the beam continued to follow the selected track. A fourth feature was implicit: whereby the system was satisfactory not only for reading video information but also for reading digital audio and data information.

Reasons for the Decision

1. The appeal complies with Articles 106 to 108 and Rule 64 EPC and is, therefore, admissible.
2. There is full agreement between the Board and the Appellant that the most relevant prior art is that disclosed in JP-A-5 538 686 (the basis for the Board's interpretation of this document being a translation into German obtained from the European Patent Office's translation department, a copy of which had been sent to the Appellant with the Examining Division's communication of 24 October 1984). Claim 1 has been drafted in the two-part form prescribed by Rule 29(1) EPC with the first part of the claim correctly based on this prior art.
3. The Board agrees with the Appellant that the cited prior art does not disclose any of the features specified in the characterising part of Claim 1. According to the characterising part of Claim 1 "the fixed duration of the disable signal corresponds to the nominal duration of a defect" whereas in the prior art the disable signal has a much longer duration which is not related to the duration of a defect. Further, according to the characterising part of Claim 1, "the reading beam is maintained in its current position relative to the record medium, during the disable signal, such that the beam continues to follow the selected track after the defect is passed" whereas in the prior art the reading beam is displaced in a radial direction relative to the record medium during the disable signal so that the beam will then follow a different track.

The subject-matter of Claim 1 is, therefore, new.

4. The Japanese citation is concerned primarily with the problem of avoiding repeated reading of video information on the same track (or the same turn of a spiral track) due to the loss of proper tracking control in the presence of a defect. In the case of video information, it is acceptable to skip one or more frames, because of the persistence of vision of the human eye. Therefore, forcing the beam on to a following track (or turn) in the manner taught by the citation is an appropriate solution when it is video information which is being read.

However, for discs carrying digital sound or data information it is not acceptable to miss out one or more turn's worth of information. In the case of audio information, the resulting disturbance is irritating to the listener. In the case of digital data, the loss of information could be disastrous.

In view of this, a person skilled in the art would have been aware of the need for avoiding repeated reading of the same track (or turn) without forcing a skip to another track (or turn). In other words, it would have been obvious to him to try to devise a system in which the reading beam is maintained in its current position relative to the record medium such that the beam continues to follow the selected track (or turn) after the defect is passed.

Furthermore, it appears from the introductory part of the description of the present application that dimples were in fact already known (description, page 2, lines 3 to 19). In any case, it can be expected that a person skilled in the art would as a matter of course investigate the cause of the loss of proper tracking. A simple visual inspection of

a disc, possibly under a microscope, would reveal the momentary deviations of the track(s) from the normal radial position. The skilled person would inevitably see that only a small part of each of a large number of tracks (or turns) is affected.

In the Board's view, a person skilled in the art, knowing the nature of the defects and desiring to avoid track skipping, would consider it worth while to try to adapt the Japanese prior art to his particular requirements.

It is considered to be extremely unlikely that he would attempt to do this in the manner suggested by the Appellant at the oral proceedings, since making two radial drives (first away from the current track and then back to the current track once the dimple had been passed) would be too slow.

The obvious thing to do would be to shorten the fixed duration of the disable signal to match the size of the defects and omit the skip to another track. Because the tracking error signal would only have to be uncoupled for a very short time, there would be a good chance that the beam would continue to follow the selected track (or current turn of a spiral track).

The inevitable consequence of following up this idea would be to construct tracking apparatus as defined in Claim 1.

Consequently, the subject-matter of Claim 1 is not considered as involving an inventive step within the meaning of Article 56 EPC.

5. Claims 2 to 4 are dependent claims, the allowability of which is conditional on that of Claim 1. Furthermore, the features specified in Claims 2 and 3 are disclosed in the Japanese citation. Choosing the duration of the disable signal to be in the range of about 100 to 200 microseconds, as specified in Claim 4, is obvious if this duration corresponds to the size of the dimples. Therefore, the Board can find no patentable matter in Claims 2 to 4.

Claims 5 and 6 are method claims corresponding to apparatus Claims 1 and 2. The Board finds that the subject-matter of Claims 5 and 6 does not involve an inventive step for analogous reasons.

Order

For these reasons, it is decided that:

the appeal is dismissed.

The Registrar

The Chairman

B A Norman

P K J van den Berg