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D E C I S I O N
of 19 November 1997

Case Number: T 1010/95 - 3.5.2

Application Number: 88308137.4

Publication Number: 0306324

IPC: G11B 7/007

Language of the proceedings: EN

Title of invention:
An optical memory system

Patentee:
Sharp Kabushiki Kaisha

Opponent:
Philips Electronics N.V.

Headword:
-

Relevant legal provisions:
EPC Art. 56

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

Decisions cited:
-

Catchword:
-

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Case Number: T 1010/95 - 3.5.2

D E C I S I O N
of the Technical Board of Appeal 3.5.2
of 19 November 1997

Appellant: (Proprietor of the patent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 16 October 1995 revoking European patent No. 0 306 324 pursuant to Article 102(1) 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. This is an appeal from the revocation by the opposition division of European patent No. 306 324. The reason given for the revocation was that the subject-matter of the claims then on file did not involve an inventive step, having regard to the following prior art:

D1: EP-A-0 189 948
D2: EP-A-0 100 995
D3: SPIE vol. 529 (1985), pages 62 to 68
D4: JA-A-6 113 458
D5: EP-A-0 164 131.

II. The appellant amended the claims further with the statement of grounds of appeal and in response thereto the respondent (opponent) referred to

D6: US-A-4 363 116

which was mentioned as prior art in D1.

III. Oral proceedings were held before the board on 19 November 1997 in the course of which the appellant, in response to arguments relating to the permissibility under Article 123(2) EPC of the amendments made on appeal, reverted to the claims as refused by the opposition division by way of a main request, and filed differently amended claims by way of an auxiliary request.

IV. Claim 1 (main request) is worded as follows:

"1. A magneto-optical memory medium comprising guide tracks (12) in the form of grooves for producing tracking error signals to control the position in which a light beam is impinged and a land region between

adjacent guide tracks (12), the width of each land region being wider than that of each of said guide tracks, the land region containing prepits (14) and data bit areas (13), the prepits (14) providing addressing information as to the track address, and the data bit areas (13) being for information to be so recorded, that information signals read out by means of reflected light derived from the light beam impinging on the data bit areas can be discriminated from the tracking error signals and said addressing information signals, characterised in that the width of each of said prepits (14) between the adjacent guide tracks is narrower than that of each of said guide tracks (12)."

Claims 2 and 3 (main request) are dependent on claim 1.

Claim 1 (auxiliary request) is worded as follows:

"1. A magneto-optical memory medium comprising guide tracks (12) in the form of grooves for producing tracking error signals to control the position in which a light beam is impinged and a land region between adjacent guide tracks (12), the width of each land region being wider than that of each of said guide tracks, the land region containing prepits (14) and data bit areas (13), the prepits (14) providing addressing information as to the track address, and the data bit areas (13) being for information to be so recorded, that information signals read out by means of reflected light derived from the light beam impinging on the data bit areas can be discriminated from the tracking error signals and said addressing information signals, characterised in that the width of each of said prepits (14) between the adjacent guide tracks is narrower than that of each of said guide tracks (12), the width of the guide tracks is less than or equal to 0.6 µm and the width of the prepits is less than or equal to 0.4 µm."

Claims 2 and 3 (auxiliary request) are dependent on claim 1.

V. The appellant requested that the decision under appeal be set aside and that the patent be maintained, in amended form, in the following version:

Main Request: as refused in the decision under appeal.

Auxiliary Request:

Claims: 1 to 3 filed in oral proceedings on 19 November 1997;

Description: columns 3 and 4 filed in oral proceedings on 19 November 1997, columns 1, 2 and 5 to 9 of the patent as granted;

Drawings: as granted.

VI. The respondent requested that the appeal be dismissed.

VII. The appellant argued essentially as follows:

In D1, which did not relate to magneto-optical memories, only Figure 6 showed a land-type preformat. The clear teaching of D1 was that the servo-groove width should be at least 60% of the track pitch, cf page 13, lines 4 to 9 and 16 to 18. As could be seen from claim 1 of D1, this was not an optional feature; nothing else was contemplated. In this respect D1 taught away from the invention to which the opposed patent related. In the case of magneto-optical memories, which were the subject of the claims of the opposed patent, and which relied on the Kerr polarisation effect, which produced a smaller signal than the large reflectance differences arising in the 'burnt pit' technology used in D1, the person skilled

in the art would maximise the land width because of the need to maximise the area for writing data to get an adequate data signal. This was the opposite of the D1 teaching.

As regards D6, it was important to note that this document related to a groove-type preformat of an **optical** memory of the kind shown (as prior art)in Figure 6 of the opposed patent, whereas the claims at issue (both requests) related to land-type preformats of a **magneto-optical** memory. In a groove-type preformat no servo-tracking signal was present when the sector address prepits were read so that the width of the lands relative to the prepits was irrelevant. Thus the dimensions indicated at column 8, lines 60 to 63 of D6, which might be interpreted as teaching that the width of the land region should be greater than that of the guide track had to be read in the context of a groove-type preformat. The person skilled in the art, addressing the problem of improving a land-format magneto-optical memory would not consider D6. In fact D1, dealing with a groove-type preformat at page 11, lines 28 to 31 taught that the land width should be much smaller than the track pitch, ie the opposite of D6. It was a clear ex post facto analysis to argue that the person skilled in the art would apply the teaching of D6 relating to a groove-type optical preformat to the problem of a land-type magneto-optical preformat where the signal detection considerations were completely different.

D4 related to land-type preformat and did not teach that the prepit width should be less that the width of the guide groove.

D5 related to an optical disk in which the prepits were formed on the guide tracks (cf D5, page 14, lines 21 to 24) so that the tracking error signal was lost where the prepits were present. This was too remote from the problem solved by the opposed patent to offer any useful suggestion to the person skilled in the art.

Auxiliary request

The dimensions specified in the further amendment to claim 1 were based on Figure 5a of the patent, corresponding to the range for the prepit and guide track widths illustrated as giving acceptable signals, ie above the x-axis in the graphs, this disclosure being supplemented by Figures 3a and 4a.

The prepit width now claimed was smaller than any value specified in D1, which document did not, in any case, suggest that a reduction in width should be aimed at. D4, which related to land-type preformats, did not disclose maximum or relative sizes of these widths. The other cited documents were less relevant.

VIII. The respondents' arguments can be summarised as follows:

The reference to D6 in D1 was quite legitimate since D1 disclosed both groove and land-type structures; only claim 2 of D1 introduced a restriction to land-type preformats. D1 at page 14, lines 3 to 9, in the context of the land-type format of Figure 6, referred to the advantage of a narrower servo-groove, namely that the information areas between the grooves can be read more effectively. D6 illustrated dimensions which were conventional for optical memory disks. Further, the differences between optical and magneto-optical **preformats** were not as great as the appellant alleged. Although the **data** bits in a magneto-optical disk are

detected by the Kerr effect both preformats comprising address prepits and guide tracks were, at the first stage, produced in the same way; the magnetic layer was added later to produce a magneto-optical preformat.

Auxiliary request

A servo-groove width of approximately 0.6 µm was mentioned in D1 at page 3, line 17 (with reference to D6). Taken together with the suggestion in D1 at pages 13 to 14 that a narrower servo-groove was advantageous, this provided a suggestion to the person skilled in the art that he should dimension the servo-groove width at or below 0.6 µm as specified in claim 1 of the auxiliary request. A very narrow servo-groove in a land-type preformat was also implicitly acknowledged as known in Figure 7 of the opposed patent. Further, D1 taught that the prepit width should be less than the servo-groove width (cf D1, Figure 6), although it was accepted that there was no disclosure of a value as low as 0.4 µm.

Reasons for the Decision

1. The appeal is admissible.

2. *Main request*

2.1 Amendments

Neither the opposition division nor the opponent (now respondent) raised any objection to the amendments made during the opposition procedure - in effect (in respect

of the main request) the patent has not been amended further on appeal. In the judgement of the board the amendments are permissible under Articles 123(2) and 123(3) EPC.

2.1 Novelty

Novelty is not in dispute.

2.2 Inventive step

In the judgement of the board, the closest prior art document is D4 which discloses a magneto-optical memory medium having a land-type format of the kind acknowledged as prior art in Figure 7 and associated description of the opposed patent. The other documents on file are less relevant as they either do not relate to magneto-optical media or, as in the case of D5, disclose a different version of the land-type format. Starting from D4 the problem solved by the memory medium of claim 1 is to modify a memory medium of the kind specified in the prior art portion of the claim in such a way that the tracking signal from the guide track is protected against interference from the signal from the address prepits, while at the same time avoiding the constraint of manufacturing prepits to a precise quarter wavelength depth, which other solutions involve; cf description of the opposed patent at column 3, lines 18 to 31 and at column 4, lines 3 to 15.

The posing of this problem does not make a contribution to an inventive step since it has to be regarded as a routine activity for the person skilled in the art to seek alternative solutions, in particular those which might overcome manufacturing constraints.

It is common ground that land-type preformats for magneto-optical memory media conventionally employ narrow guide-track grooves, ie narrower than the land area (cf D4, D5 and Figure 7 of the opposed patent), since a larger land width is required to generate a useable Kerr effect signal from the data bits recorded in the land area between the grooves and this feature is accordingly specified in the prior art portion of the claim. The person skilled in the art would appreciate that this reduces the guide track signal relative to the address prepit signal and that, if possible, something should be done to counteract this. Given that strengthening the guide track signal by increasing the guide track width solely in the address prepit area is hardly an attractive option from the point of view of ease of manufacture, the skilled person would, in the judgement of the board, consider weakening the interfering prepit signal by reducing the prepit width relative to the guide track width, thus arriving at a magneto-optical memory medium as specified in claim 1 by following obvious routine considerations to solve the problem mentioned above.

The board concludes therefore that the subject matter of claim 1 does not involve an inventive step within the meaning of Article 56 EPC and that, accordingly, the patent as amended in accordance with the main request cannot be maintained.

3. *Auxiliary request*

3.1 Amendments

Claim 1 has been amended, relative to the main request, by the addition of the further characterising features that "the width of the guide tracks is less than or equal to 0.6 µm and the width of the prepits is less

than or equal to 0.4 µm." These features, which restrict the scope of protection, were undisputedly directly and unambiguously disclosed in Figures 3a, 4a and 5a of the application as filed and the amendments are accordingly permissible under Articles 123(2) and 123(3) EPC.

3.2 Novelty

Novelty is not in dispute.

3.3 Inventive step

The solution defined by claim 1 of the auxiliary request goes significantly further than that of the main request. Whereas, as indicated above, the skilled person would be expected to consider reducing the prepit width relative to the guide track width, in the judgement of the board, it would not be obvious to go so far as to choose an absolute dimension of less than 0.4µm. It is common ground that this is smaller than any prior art prepit width, and in that respect alone it is outside the routine considerations of the skilled person. Given that the guide track width and the prepit width represent two independent degrees of freedom of design choice it would not be plausible to assume that reasonable systematic trial would inevitably lead to the claimed dimensional combination, even if the prepit width were within a conventional range; the fact that it is not, puts the combination as claimed well outside the realm of routine experiment.

The board concludes therefore that, having regard to the prior art on file, the claimed magneto-optical memory medium is not obvious for the person skilled in the art so that the subject matter of claim 1 involves an inventive step within the meaning of Article 56 EPC.

4. In the view of the board the patent, as amended in accordance with the auxiliary request, and the invention to which it relates meet the requirements of the EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The appellant's main request is refused.

3. The case is remitted to the department of first instance with the order to maintain the patent in amended form in the following version:

Claims: 1 to 3 filed in oral proceedings on 19 November 1997;

Description: columns 3 and 4 filed in oral proceedings on 19 November 1997, columns 1, 2 and 5 to 9 of the patent as granted;

Drawings: as granted.

The Registrar: The Chairman:

M. Kiehl W. J. L. Wheeler