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DECISION
of 11 September 2003

Case Number: T 0087/01 - 3.5.2

Application Number: 88112739.3

Publication Number: 0309689

IPC: G11B 7/09

Language of the proceedings: EN

Title of invention:
Optical pickup and hologram therefor

Patentee:
NEC Corporation

Opponent:
Koninklijke Philips Electronics N.V.

Headword:

-

Relevant legal provisions:
EPC Art. 54(3), 56, 69, 123(3)

Keyword:
"Novelty - main and first auxiliary request (no)"
"Extension of the protection - second auxiliary request (yes)"
"Inventive step - third auxiliary request (yes)"

Decisions cited:
G 0001/93, T 0108/91, T 0031/93, T 0774/97, T 1011/96,
T 0762/95, T 0116/99

Catchword:

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Case Number: T 0087/01 - 3.5.2

D E C I S I O N
of the Technical Board of Appeal 3.5.2
of 11 September 2003

Appellant: Koninklijke Philips Electronics N.V.
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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
22 November 2000 concerning maintenance of
European patent No. 0309689 in amended form.

Composition of the Board:

Chairman: W. J. L. Wheeler
Members: J.-M. Cannard
B. J. Schachenmann

Summary of Facts and Submissions

I. The opponent appealed against the decision of the opposition division concerning the maintenance of European patent No. 0 309 689 in amended form in accordance with the proprietor's second auxiliary request filed on 7 July 2000 during oral proceedings before the opposition division.

II. Prior art documents:

D1: EP-A-0 305 169,

D2: EP-A-0 228 620,

considered during the proceedings before the opposition division, remain relevant to the present appeal.

III. The claims of the proprietor's main request filed with the letter of 11 August 2003 read as follows:

(i) claim 1 for DE and GB only:

"An optical pickup for picking up signals from a signal surface of an optical disk (6), comprising:

a) a laser light source (1) for emitting a laser beam;

b) splitting means (15B) for splitting said laser beam emitted from said laser light source (1) into three light beams,

- c) an object lens (5) disposed in front of said optical disk (6), for focusing said three light beams coming from said splitting means (15B) on said signal surface of said optical disk (6);
- d1) diffraction means (15A) for diffracting return light beams reflected from said signal surface; and
- e) photodetector means (11) disposed in a direction of diffracted return light beams from said diffraction means, for detecting said diffracted return light beams;

said optical pickup further comprising:

- f) a first surface (15A) of a hologram (15) constituting said diffraction means, and
- g) a diffraction grating (15B) formed on a second surface of said hologram (15), said diffraction grating (15B) constituting said splitting means,

wherein in said optical pickup,

- d2) said diffraction means (15A) is disposed between said splitting means (15B) and said object lens (5)."

Claims 2 to 5 are dependent on the preceding claims.

- (ii) claim 1 for FR only, as granted:

"An optical pickup for picking up signals from a signal surface of an optical disk (6), comprising:

- a) a laser light source (1) for emitting a laser beam;
- b) splitting means (2;15B) for splitting said laser beam emitted from said laser light source (1) into three light beams;
- c) an object lens (5) disposed in front of said optical disk (1), for focusing said three light beams coming from said splitting means (2) on said signal surface of said optical disk (1);
- d) diffraction means (10A;15A) disposed between said splitting means (2) and said object lens (5), for diffracting return light beams reflected from said signal surface (1);
- e) photodetector means (11) disposed in a direction of diffracted return light beams from said diffraction means, for detecting said diffracted return light beams, said optical pickup further comprising:
- f) a first surface (10A; 15A) of a hologram (10;15) constituting said diffraction means, and
- g) a diffraction grating (15B) formed on a second surface of said hologram (15), said diffraction grating (15B) constituting said splitting means."

Dependent claims 2 to 5 as granted.

- IV. The claims according to the appellant's first auxiliary request filed with the letter of 11 August 2003 differ from the claims according to the main request in that, in paragraph c) of claim 1 for DE and GB only, the expression "an object lens" has been replaced by the expression "a single object lens."
- V. The claims according to the appellant's second auxiliary request filed with the letter of 11 August 2003 differ from the claims according to the main request in that the feature according to paragraph d2) of claim 1 for DE and GB only has been amended to read: "said splitting means (15B) is disposed between said diffraction means (15A) and said object lens (5)".
- VI. The claims according to the appellant's third auxiliary request filed with the letter of 11 August 2003 differ from the claims according to the main request in that the claims for DE and GB only have been cancelled.
- VII. Oral proceedings were held on 11 September 2003.
- VIII. The arguments of the appellant opponent can be summarised as follows:

The wording of claims 1 for DE and GB only of the main and first auxiliary request did not specify that the three light beams focused by the object lens (5) were directly coming from the splitting means (15B). There was thus no difference between the optical pickup disclosed in document D1 and the optical pickup according to said claims.

The disposition of the splitting means (15B) specified in feature (d2) of claim 1 for DE and GB only of the second auxiliary request was an alternative to, and not covered by, the disposition of this means according to granted claim 1. The claims of the second auxiliary request extended the protection conferred by the granted patent, contrary to Article 123(3) EPC.

The starting point for the invention according to claim 1 for FR only of the third auxiliary request was the prior art mentioned in column 1 of the patent with reference to Figure 1 as a conventional three-beam-type optical pickup. The pickup according to claim 1 differed from the prior art pickup in that the beam splitter (3) and the lenses (7 and 8) were replaced by one hologram (diffraction means 10). Document D2 disclosed an optical pickup (Figure 4) which differed from the prior art acknowledged in D2 (Figure 1) in that the beam splitter (46) and the wedge prisms (51 and 52) were replaced by one hologram (diffraction grating 75). The skilled person faced with the problem of providing an optical pickup which was less costly and easier to align and miniaturize than the prior art pickup, had a reason to look at document D2 because it related to the same problem as the invention. The solution taught by D2 was independent of the type of track error detection. The integration of two gratings at different sides of a plate was common practice in optics. Claim 1 of the third auxiliary request lacked an inventive step in view of the combination of the prior art pickup of Figure 1 of the patent with the teaching of D2.

IX. The arguments of respondent proprietor can be summarised as follows:

Feature (c) according to claim 1 for DE and GB only of the main request did not specify any means between the splitting means and the object lens and should be read in the light of the examples described in the patent according to which the main beam produced by the splitting means was not influenced by the hologram (10,15A) and the first order beams were not imaged on the surface of the disk. The optical pickup according to D1 comprised a collimating lens (5) which influenced the directions of the beams passing through it, but did not focus the light coming from the splitting means, and an objective lens (6) which focused on the disk the light beams coming from the collimating lens. D1, which formed part of the prior art according to Article 54(3) EPC, did not directly and unambiguously disclose an object lens according to feature (c) of claim 1.

D1 disclosed two lenses (5 and 6) for focusing the light beams coming from the splitting means on the surface of the optical disk and not a single object lens as set out in claim 1 for DE and GB only of the first auxiliary request.

The optical pickup according to claim 1 for DE and GB only of the second auxiliary request which corresponded to the pickup according to Figure 5 of the patent did not extend the protection conferred by the patent. This pickup differed from the pickup according to granted claim 1 by the disposition of the hologram with respect to the object lens. However, the skilled person reading together the description and claim 1 of the patent

understood that this claim was intended to cover the optical pickup according to Figure 5 of the patent.

The subject-matter of claim 1 for FR only according to the third auxiliary request was novel and inventive. The prior art according to Figure 1 of the patent could not be used for assessing the inventive step of claim 1 because it was internal prior art and it was not clear whether it corresponded to a published document or was on the market fifteen years ago. The functions provided by the diffraction grating (75) in D2 were different from the functions of the arrangement of the beam splitter (3) and the lenses (7 and 8) in the optical pickup according to the prior art of Figure 1 of the patent. Splitting means and diffraction means disposed on the opposite sides of a hologram as set out in claim 1 were disclosed neither in Figure 1 of the patent nor in D2. There was no obvious reason why the skilled man would have replaced the above arrangement by the diffraction grating of D2 and at the same time would have disposed said grating and the splitting means of Figure 1 of the patent on a single plate.

- X. The appellant requested that the decision under appeal be set aside and the European patent No. 0 309 689 be revoked in its entirety.

- XI. The respondent requested that the appeal be dismissed and that the patent be maintained in amended form according to the main request or one of the first to third auxiliary request, all as filed with the letter dated 11 August 2003.

Reasons for the Decision

1. The appeal is admissible.

Main request - Claim 1 for DE and GB

2. Document D1 was published after the date of filing of the opposed patent. It is common ground that D1 forms part of the state of the art under Article 54(3) EPC regarding claim 1 for DE and GB of the main request. It is likewise not contested by the proprietor that D1 discloses an optical pickup which according to the embodiment of realisation of figures 12 and 13 (see column 9, line 21 to column 10, line 35) comprises all the features set out in claim 1 for DE and GB of the main request, except feature (c) according to which an object lens (5) is disposed in front of an optical disk (6) for focusing three light beams coming from a splitting means on the signal surface of the optical disk (6).

- 2.1 An optical pickup in which diffraction means are disposed between splitting means and an object lens is only supported by the embodiment of realisation disclosed in the patent in suit with reference to Figure 2. According to this embodiment, the light beam emitted by the laser diode is split by a diffraction grating (splitting means 2) into three light beams which are transmitted to diffracting means (hologram 10) and then focused by the object lens. Accordingly, feature (c) of claim 1 for DE and GB of the main request cannot be interpreted on the basis of the description of the patent as restricted to an object lens which focuses three light beams **directly** coming

from the splitting means of the pickup, but it more generally covers an object lens which focuses on an optical disk three light beams split by said splitting means (2). The pickup according to claim 1 and the pickup disclosed by D1 must be interpreted in the same way. Therefore, the embodiment of Figures 12 and 13 of D1, in which the three light beams split by the diffraction grating (4a) are transmitted to the objective lens (6) via both the hologram (3) and the collimating lens (5) for focusing on the optical disk (7), should be understood as disclosing an optical pickup in which the objective lens (6) focuses on the surface of the disk the three light beams coming from the splitting means (4a).

- 2.2 There is nothing in the patent for supporting the proprietor's allegations that according to claim 1 the split main beam was not influenced by the hologram (10) and the split first order beams were not imaged on the disk. It is irrelevant, contrary to the proprietor's view, that the objective lens (6) in Figure 13 of D1 focuses on the optical disk the beams made parallel by the collimating lens (5). Accordingly, D1 discloses an optical pickup comprising feature (c) of claim 1 for DE and GB of the main request. This claim thus lacks novelty (Article 54(3) EPC).

First auxiliary request - Claim 1 for DE and GB

3. Claim 1 for DE and GB of the first auxiliary request merely differs from claim 1 for DE and GB of the main request in that the expression "an object lens" has been replaced by the expression "a **single** object lens". In the embodiment of Figures 12 and 13 of D1, the lens

(5) is a collimating lens which renders parallel the three light beams passing therethrough and the three beams formed by the diffraction means (4a) are only focused on the surface of the optical disk (7) by the **single** objective lens (6). Accordingly, claim 1 for DE and GB of the first auxiliary request lacks novelty for the same reasons as those given in respect of claim 1 for DE and GB of the main request.

Second auxiliary request - Claim 1 for DE and GB

4. Claim 1 for DE and GB of the second auxiliary request differs in substance from claim 1 as granted in that the feature according to which the diffraction means are "disposed between said splitting means (2) and said object lens" are replaced by the feature "said splitting means (15B) is disposed between said diffraction means (15A) and said object lens (5)". Claim 1 for DE and GB of the second auxiliary request thus corresponds to the optical pickup described in the embodiment of realisation according to Figure 5 of both the application as originally filed and the patent in suit. However the subject-matter of this claim does not result from a limitation of the subject-matter of claim 1 as granted.

- 4.1 The proprietor, referring to the Case Law of the Boards of Appeal (T 108/91, OJ 1994, 228, and non published decisions T 31/93, T 774/97, T 1011/96, T 762/95 and T 116/99), argued that claim 1 for DE and GB of the second auxiliary request did not contravene Article 123(3) EPC because, in view of Article 69 EPC and its Protocol on Interpretation, the skilled person reading together the description and claim 1 of the

patent in suit would understand that said claim covered the optical pickup according to the embodiment shown in Figure 5 of the patent.

- 4.2 In decisions T 108/91 and T 31/93 (point 2), a feature included in claim 1 during the examination proceedings did not correspond to what was originally disclosed. It was immediately apparent that what was defined in granted claim 1 when interpreted on the basis of the description and drawings could not be that for which protection was sought. The replacement of the incorrect feature by the correct one was considered, on a fair interpretation of the claim in the light of the totality of the disclosure, as not extending the protection. In decisions T 774/97 (point 4) and T 1011/96 (point 2), claim 1 as granted contains unclear expressions. The Board considered that the amendments made in appeal proceedings solely serving to remove inconsistencies between the subject-matter of the granted claim and the accompanying description did not infringe Article 123(3) EPC. According to decision T 762/95 (point 2), no extension of the protection conferred resulted from the correction of an inconsistency in a granted claim if the correction was either apparent from the claim itself or from the true construction of the claim in the context of the specification. According to decision T 116/99 (point 2), the scope of a claim must be assessed taking into account not only the claims but also the description and the drawings. Interpreted in this way, the amendments to claim 1 as granted (which covered a fuel additive per se) to specify a fuel composition comprising the additive did not extend the protection conferred.

4.3 In the present case, claim 1 as granted results from the combination of claims 1 to 4 as originally filed and its subject-matter is clearly understandable in itself without needing any interpretation on the basis of the description. It is true however that the optical pickup specified in claim 1 as granted is supported neither by the example of realisation according to Figure 2 of the patent, from which it differs by the restriction that the splitting means is formed on a second surface of a hologram, nor by the example of realisation according to Figure 5 of the patent, which shows an inverted disposition of the splitting means and the hologram in respect of the object lens.

4.4 However, in the present case, which is distinguishable from the situation in the decisions cited by the proprietor, it is not immediately apparent to the skilled reader that the optical pickup according granted claim 1, which corresponds to the subject-matter of originally filed claim 4 as dependent on originally filed claims 1 to 3, does not correspond to the pickup for which protection was sought. Nor is it immediately apparent which one of the two described embodiments of optical pickups the proprietor might have intended to protect. Accordingly, the Board judges that claim 1 as granted would be understood by the skilled reader as specifying the optical pickup identified by its own wording and should not be interpreted as covering the embodiment of realisation of Figure 5 of the patent in suit. Claim 1 for DE and GB of the second auxiliary request thus extends the protection conferred by the patent as granted.

4.5 In decision G 1/93 (OJ 1994, 541), the Enlarged Board of Appeal pronouncing on the question of "limiting extensions" observed that "Article 123(3) EPC is directly aimed at protecting the interests of third parties by prohibiting any broadening of the claims of a granted patent, even if there should be a basis for such a broadening in the application as filed" and that "the ultimate responsibility for any amendment of a patent application (or a patent) always remains that of the applicant (or the patentee)" and judged that even in the case of "limiting extensions" a patent which infringes Article 123(3) had to be revoked. In the present case, granted claim 1 does not contain a "limiting extension". The Board however sees no good reason in the fact that its subject-matter may be different from what the proprietor declared he had intended to cover for adopting a less strict attitude than in the case of "limiting extensions". Accordingly, claim 1 for DE and GB of the second auxiliary request is not acceptable.

Third auxiliary request

5. Claim 1 for FR only of the third auxiliary request is identical to claim 1 as granted. According to the appellant, the conventional three-beam-type optical pickup described in the patent in suit (column 1, lines 6 to 43) with reference to Figure 1 forms the closest prior art.

5.1 The proprietor stated during the oral proceedings that the optical pickup according to Figure 1 of the patent was merely cited as the background art in view of

Rule 27(1)b EPC and corresponded to internal prior art which was not public at the filing date of the patent.

5.2 The Board observes that the prior art according to Figure 1 was described in the patent as a **conventional** three-beam-type optical pickup. The skilled reader will thus understand from the patent that this pickup has been used or produced on such a scale that it had become conventional before the filing date of the application for the present patent and thus formed part of the general knowledge of the skilled person. The Board considers that the retraction of the proprietor at a late stage of the appeal proceedings, during the oral proceedings, is unfair and deprives the appellant, who had been relying on the truth of the disclosure that Figure 1 of the patent showed prior art, of the possibility of searching for a published document disclosing a pickup according to Figure 1. The Board judges therefore that the prior art according to Figure 1 of the patent, which was cited and acknowledged in the patent as the closest prior art for the purpose of formulating the technical problem set out in the description, forms the correct starting point for the assessment of the invention and can be used for assessing inventive step, at least for the purposes of this decision.

6. According to the prior art of Figure 1 of the patent, a conventional three-beam-type optical pickup comprises the following features of claim 1:

- a laser source (diode 1) for emitting a laser light beam,

- a diffraction grating (2) for splitting said laser beam into three light beams,
- an object lens (5) for focusing the three light beams coming from the diffraction grating on the surface of an optical disk (6) and
- a photodetector assembly (9) for detecting the light beams reflected from the surface of the disk.

6.1 In contrast with the pickup set out in claim 1, the three light beams reflected on the surface of disk are according to Figure 1 deflected by a beam splitter (3), and not by diffraction means, towards the photodetector assembly; and said diffraction grating and diffraction means are not formed on respective surfaces of a hologram.

6.2 According to description of the patent (column 1, lines 44 to 54), the high number of optical elements used in the prior art of Figure 1 renders the conventional pickup bulky and costly, not easy to miniaturize and adjust. Starting from this prior art the objective problem addressed by the invention can thus be seen as providing a three-beam optical pickup which remedies these drawbacks. According to claim 1, the problem is solved by using a first surface of a hologram constituting a diffraction means for diffracting the light beams reflected from the surface of the disk, forming the splitting means on the second surface of the hologram and disposing the diffraction means between the splitting means and the object lens.

7. D2 (Figure 4; column 9, line 29 to column 10, line 22 and column 11, lines 20 to 35) discloses an optical pickup in which a holographic diffraction grating (75) receives the beam emitted by a laser source (43) to produce a zeroth-order diffracted beam which is focused by an objective lens (44) on the surface of an optical disk (41). The diffraction grating is responsive to the beam reflected from the disk (via the objective lens) to produce a plurality of sideways diffracted beams directed to a detector assembly (45). This pickup is an improvement to a bulky and heavy prior art pickup (Figure 1 of D2) in which the light beam reflected from the disk was split by wedge prisms (51, 52) into two beams directed to the detector assembly (column 2, lines 10 to 19; column 6, lines 12 to 53).

8. According to the appellant, the skilled man starting from the prior art according to Figure 1 of the patent would immediately recognize that the technical problem, namely replacing a bulky and costly optical assembly in an optical pickup, is the same as the technical problem solved by the pickup of Figure 4 in D2 in view of its own prior art (Figure 1 of D2). It would then be obvious to replace the splitter (3) and the lenses (7 and 8) in the prior art pickup of figure 1 of the patent by the diffraction grating (75) of D2 and to arrive at the optical pickup of claim 1. The Board cannot share the appellant's view.

- 8.1 In Figure 1 of the patent, **three** light beams are focused on, and reflected from, the surface of the optical disk. The beam splitter (3) is used to transmit to the object lens the **three** light beams coming from the splitting means, and to reflect the **three** light

beams reflected from the disk through the lenses (7 and 8) to form spots on the detector assembly. In contrast with that, according to D2 one, and only one, light beam is focused on, and reflected from, the disk. The diffraction means (75) in D2 are configured so as to produce and transmit to the objective lens a zeroth-order diffraction beam and are responsive to the single light beam reflected from the optical disk to produce a plurality of sideways diffracted beams.

8.2 It is clear that the straightforward replacement of the beam splitter (3) and the lenses (7 and 8) in the prior art of Figure 1 of the patent by the diffraction grating of D2 would not, by itself, result in a hologram as specified in features (f) and (g) of claim 1, whose first and second surfaces respectively constitute diffraction means and splitting means.

8.3 Thus, the combination of the prior art according to Figure 1 of the patent with the teaching of D2 does not lead to the optical pickup set out in claim 1, and does not render it obvious.

9. Accordingly, the arguments of the appellant have not convinced the Board that the subject-matter of claim 1 for FR only of the third auxiliary request was obvious to the person skilled in the art. The Board therefore concludes that the subject-matter of this claim shall be considered as involving an inventive step within the meaning of Article 56 EPC.

10. In the Board's judgement, the patent in suit, in the version for FR only, and the invention to which it relates satisfy the requirements of the Convention.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance with the order to maintain the patent on the basis of claims 1 to 5, description and drawings as granted for the designated Contracting State FR only, and to revoke the patent for the designated Contracting States DE and GB, in accordance with the third auxiliary request of the proprietor.

The Registrar:

The Chairman:

D. Sauter

W. J. L. Wheeler