

BESCHWERDEKAMMERN
DES EUROPÄISCHEN
PATENTAMTS

BOARDS OF APPEAL OF
THE EUROPEAN PATENT
OFFICE

CHAMBRES DE RECOURS
DE L'OFFICE EUROPEEN
DES BREVETS

Internal distribution code:

- (A) Publication in OJ
(B) To Chairmen and Members
(C) To Chairmen

D E C I S I O N
of 25 June 1997

Case Number: T 0334/95 - 3.5.2

Application Number: 86114853.4

Publication Number: 0222238

IPC: G11B 7/12

Language of the proceedings: EN

Title of invention:
Pick-up device

Patentee:
SHARP KABUSHIKI KAISHA

Opponent:
Philips Electronics N.V.

Headword:
-

Relevant legal provisions:
EPC Art. 54, 56
EPC R. 64(a)

Keyword:
"Appeal admissible - name and address of appellant not in
doubt"
"Novelty (yes)"
"Inventive step (yes)"

Decisions cited:
T 0025/85

Catchword:
-



Case Number: T 0334/95 - 3.5.2

D E C I S I O N
of the Technical Board of Appeal 3.5.2
of 25 June 1997

Appellant: Philips Electronics N.V.
(Opponent) Groenewoudseweg 1
NL-5621 Eindhoven (NL)

Representative: Cobben, Louis Marie Hubert
INTERNATIONAAL OCTROOIBUREAU B.V.
Prof. Holstlaan 6
5656 AA Eindhoven (NL)

Respondent: SHARP KABUSHIKI KAISHA
(Proprietor of the patent) 22-22 Nagaike-cho
Abeno-ku
Osaka 545 (JP)

Representative: Selting, Günther, Dipl.-Ing.
Patentanwälte
von Kreisler, Selting, Werner
Postfach 10 22 41
50462 Köln (DE)

Decision under appeal: Interlocutory decision of the Opposition Division
of the European Patent Office posted 7 February
1995 concerning maintenance of the European
patent No. 0 222 238 in amended form.

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 interlocutory decision of the opposition division concerning maintenance of European patent No. 0 222 238 in amended form. The appeal was filed by the professional representative of the opponent, without stating the name and address of the appellant.

II. The patent has only one claim, which, in its amended form, is worded as follows:

"Optical pick-up device for recording and/or reproducing information onto and from a recording medium, comprising:

- a light source (7),
- a condenser lens (2) for collecting the light of said light source (7) and projecting it onto said recording medium,
- a light diffraction grating (3') provided between said light source (7) and said condenser lens (2) for dividing the light reflected from said recording medium,
- a light detecting means for receiving the light reflected from said recording medium and diffracted by said light diffraction grating (3'), said light detecting means being a single detector (6) placed at one side of said light source (7),

characterized in that,

- said light diffraction grating (3') is a blazed grating with grooves having a steep and shallow face so as to deflect onto said light detector (6) only the light reflected from that position (A) of said recording medium from which information is to be reproduced."

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 patent was not patentable because it did not involve an inventive step and that the patent did not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art. The latter ground was not pursued on appeal.

IV. In the appeal proceedings the appellant referred to the following prior art documents which had been considered in the first instance proceedings:

D1: "Optische Fokusfehlerdetektion", in: Neues aus der Technik, Nr. 6, December 1980, page 3

D2: US-A-4 358 200

D3: DE-A-3 346 812 and DE-C-3 346 812

D4: Introduction to classical and modern optics, pages 241 to 242 by Jürgen R. Meyer-Arendt, 1972

D5: Optics, Miles V. Klein, 1970, pages 342 to 343

D6: ABC der Optik by Karl Mütze et al., 1972, Verlag Werner Dausien - Hanau/Main, pages 143, 209 to 210

D7: Bauelemente der Optik by H. Naumann/G. Schröder,
1983, Carl Hanser Verlag - München/Wien, pages 471
to 472

and cited the following further document which belongs
to the state of the art within the meaning of
Article 54(3) EPC:

D8: EP-A-0 219 908.

V. The respondent challenged the admissibility of the
appeal, alleging that the appellant (i.e. the
professional representative) had not been a party to
the opposition procedure. In the annex accompanying the
summons to oral proceedings the board indicated that
there could be no real doubt as to the identity of the
appellant, and referred to the decision T25/85 (OJ EPO,
1986, 81). At the start of the oral proceedings held on
25 June 1997 the appellant's representative stated the
name of the appellant and the respondent stated that
the admissibility of the appeal was no longer
contested.

VI. On the substantive issues, the appellant argued
essentially as follows:

Each of the documents D1 to D3 and especially D2
described an optical pick-up device comprising a light
source, a condenser lens, a light diffraction grating
and a light detecting means as set out in the preamble
of claim 1. It was implicitly disclosed in D2 and D3
that the grating had a blaze characteristic because it
followed from the described effects produced by the
grating. Thus, in D2 the light intensity of a first
order beam was stated to be 40% of the intensity of the
incident light. If a blazed grating was not used the
intensity of the zero order beam reaching the read spot
would be only 20% of the intensity of the source and

only 8% of the source intensity would reach the light detector, so that the signal would be too weak. Blazed gratings were generally known state of the art as exemplified by D4 and D5 (reflection gratings) or D6 and D7 (transmission gratings). Consequently, it did not involve an inventive step to use a blazed transmission grating in the optical pick-up device known from D2, because it was known that the only grating which favours a single beam of a certain diffraction order was a blazed grating. With respect to D3 the subject-matter of the amended claim 1 was not new.

The provision of a blazed grating was not linked with the reduction of cross-talk. Figure 3 of the patent in suit was not correct in that the rays shown reflected from the recording medium did not obey Snell's law. Cross-talk could only be suppressed by arranging for the first order beam to be sufficiently far away from the zero order beam.

D8, which was comprised in the state of the art within the meaning of Article 54(3) EPC, concerned a pick-up device comprising a blazed grating. Starting from a symmetrical grating it was said in D8 - see column 3, lines 42 to 47 of the patent specification granted on D8 - that "the grating parameters, specifically the grating period, the depth of the grating grooves and the shape of the grating grooves, may be selected in such a way that most of the incident radiation is diffracted in one of the first order beams." Therefore, although D8 did not explicitly disclose a blazed grating, such a grating was implicitly disclosed for a person skilled in the art. The subject-matter of claim 1 was therefore not new in view of D8.

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

It was not questioned that blazed diffraction gratings were well known. However, the prior art documents on file did not mention the use of a blazed diffraction grating in order to reduce or suppress cross-talk in an optical pick-up device according to D1, D2 or D3. D2, especially, used a normal diffraction grating and did not teach the suppression of one of the first order beams by means of a blazed grating. Moreover, the surface of a recording optical medium was not flat, so that reflected light from both the first order side spots produced by a normal diffraction grating could reach the detector. That this could constitute a problem was not recognized in the prior art on file.

D8 recommended increasing the light amount received by the photo-detector by appropriately varying the groove shape of the diffraction grating; nothing was taught therein about reducing the cross-talk by making the groove shape of the grating asymmetrical. Moreover, it was possible to concentrate light into the first order beams in a symmetrical diffraction grating. The disclosure of D8 was therefore more remote from the invention than that of documents D1 to D3.

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 respondent no longer contests the admissibility of the appeal. Since the name and address of the opponent are on the file relating to the opposition and the appeal was filed by the same representative under the same reference number (OPH 14.387) there can be no real doubt as to the identity of the appellant, which was confirmed at the oral proceedings. Following the usual practice of the boards of appeal in such cases, as explained in paragraph 11 of the reasons in decision T 25/85 (OJ EPO, 1986, 81), the requirements of Rule 64(a) EPC are regarded as met. Since the other requirements for admissibility are also met, the appeal is admissible.

2. In view of the fact that the respondent has not objected to the introduction in the grounds of appeal of the new document D8 and the new ground of opposition of lack of novelty with respect to D3 or D8, and has commented substantively on the appellant's arguments based on this point, the board will consider them too.

3. The appellant has argued that the subject-matter of claim 1 of the patent in suit is not new with respect to D3 or D8 and does not involve an inventive step having regard to D2 and common general knowledge in the art as shown by D4 to D7.

4. *Novelty*
 - 4.1 The document D3 describes - see figure 3 - an optical pick-up device comprising a laser source 21, a diffraction grating 28, a condenser 23 and a photo detector 25. D3 teaches that the diffraction grating could be arranged to produce only two first order beams without generation of zero order light - see page 7,

lines 9 to 11 and lines 14 to 19. One first order beam is vertically irradiated onto the disc - see figure 3 and page 7, lines 19 and 20 - whereas the other first order beam is not shown in figure 3 - see page 7, second and third paragraphs. The reflected light from the recording medium 24 is split into two first order beams - see the paragraph bridging pages 7 and 8 - one of the first order beams reaching the laser source 11 and the other the photo detector 25. This implies that the diffraction grating 28 is not a blazed grating. No mention can be found in D3, that a blazed diffraction grating could be used.

4.2 Document D8 - see figure 1 - discloses an optical pick-up device comprising a light source 17, a condenser lens 6, a light diffraction grating 9 with subgratings 10 and 11 having the same grating period but whose grating strips extend at opposite angles to the bounding line between the subgratings - see figure 2 - for beam splitting, and two light detectors 16, 17 and 18, 19, respectively, on opposite sides of the light source 17. D8, however, does not explicitly disclose, or imply, that the grating is blazed. It is not absolutely necessary for the grooves of each subgrating to be of asymmetrical shape in order to concentrate the light reflected from the read spot 7 into the desired diffraction order.

4.3 The board therefore concludes that the subject-matter of claim 1 is new within the meaning of Article 54 EPC.

5. *Inventive step*

5.1 In the oral proceedings, the appellant concentrated on D2 as being the closest prior art from which to argue obviousness.

- 5.2 Document D2 - see figure 5 - discloses a compact optical pick-up device comprising a light source 7, a diffraction grating 25, a condenser lens 16 and a detector 13 located at one side of the light source 7. The detector 13 comprises four subdetectors A,B,C,D for focussing error detection. The information signal is obtained by adding the output signals from the four subdetectors - see the paragraph bridging columns 4 and 5. The detector 13 may therefore be considered as a single detector as far as the information signal is concerned. Hence D2 discloses an optical pick-up device in accordance with the preamble of claim 1.
- 5.3 Starting from D2, the relevant technical problem for the purpose of assessing inventive step is to increase the suppression of cross-talk in an optical pick-up device of the type in which a diffraction grating is used to deflect light onto a detector positioned at one side of the light source.
- 5.4 This problem is solved in accordance with the teaching of the opposed patent by the provision of a blazed grating in the manner specified in the characterising portion of claim 1.
- 5.5 The question which therefore falls to be decided by the board is whether it would be obvious to the skilled person, starting from D2, to use a blazed diffraction grating and thereby come to the solution specified in claim 1.
- 5.6 Document D2 describes a diffraction grating which may be formed so that a comparatively great part of the radiation intensity reflected by the recording medium, eg 40%, will be contained in a first order beam - see the paragraph bridging columns 6 and 7.

5.7 The appellant alleged that this comparatively great part implied a blazed diffraction grating. The term "a first order beam" does not, however, exclude that both first order beams are present. Moreover, it cannot be deduced from the comparatively large part of 40% of the incident light in a first order beam, that the grating should be blazed. Such a comparatively large part can be obtained with a non-blazed grating too. While it is true that, as argued by the appellant, only a relatively low fraction (8%) of the intensity of the output beam 8 produced by the light source 7 would reach the detector in the case of a non-blazed grating, this does not mean that the detected signal would be too weak, provided the intensity of the output beam is great enough.

5.8 Document D2 teaches that the period of the grating should be selected such that non zero-order light beams formed by diffraction during the first passage of the beam 8 through the grating are situated sufficiently far from the zero-order beam, so that the non zero-order beams, after reflection from the recording medium, cannot reach the detector or the radiation source - see column 7, lines 10 to 17. This requirement of a relatively large diffraction angle for the first and higher order beams does, however, not require a blazed grating with asymmetrical grooves. Indeed, no implication of a blazed grating can be found in D2.

5.9 As is well known, the surface of the recording medium (in practice a compact disc or CD as it is usually called) does not reflect light beams only by specular reflection, as implied by the appellant, but produces scattering effects of its own, so that some light from a first order beam could be returned to the grating and diffracted onto the detector, causing cross-talk. This problem is not addressed in D2.

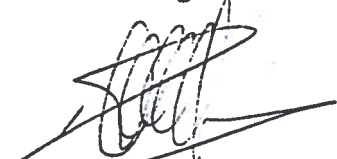
- 5.10 Although the design of blazed gratings *per se* is common general knowledge in the art, as exemplified by D4 to D7, no suggestion can be found in any of these documents that a blazed grating would be useful in suppressing cross-talk in an optical pick-up device of the kind known from D2.
- 5.11 Documents D1 and D3, which also disclose optical pick-up devices in accordance with the preamble of claim 1, will now be considered. D1 teaches the use of a grating comprising two subgratings having different grating periods for providing two separate beams for focussing control; there is no suggestion of a blazed grating. It is implicit in the analysis of the teaching of D3 provided in paragraph 4.1 above that such a suggestion is also not derivable from the latter document.
- 5.12 The board therefore concludes that the subject-matter of claim 1 as amended before the opposition division involves an inventive step within the meaning of Article 56 EPC.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:



M. Kiehl

The Chairman:



W. J. L. Wheeler