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D E C I S I O N
of 2 February 2000

Case Number: T 0250/99 - 3.4.2

Application Number: 90308633.8

Publication Number: 0412751

IPC: G02B 5/18

Language of the proceedings: EN

Title of invention:
Diffractive lens

Patentee:
MINNESOTA MINING AND MANUFACTURING COMPANY

Opponent:
Asahi Kogaku Kogyo K.K.

Headword:
-

Relevant legal provisions:
EPC Art. 123(2), 84, 111

Keyword:
"Added subject-matter - no (after amendment)"
"Clarity of claim - yes (after amendment)"

Decisions cited:
-

Catchword:
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Boards of Appeal

Chambres de recours

Case Number: T 0250/99- 3.4.2

D E C I S I O N
of the Technical Board of Appeal 3.4.2
of 2 February 2000

Appellant: MINNESOTA MINING AND MANUFACTURING COMPANY
(Proprietor of the patent) 3M Center
P.O. Box 33427
St. Paul
Minnesota 55133-3427 (US)

Representative: Akers, Noel James
Akers & Co.
13 Queen Victoria Street
Macclesfield, Cheshire SK11 6LP (GB)

Respondent: Asahi Kogaku Kogaku Kogyo K.K.
(Opponent) 36-9, Maenochō 2-chōme
Itabashi-ku
Tokyo (JP)

Representative: Schaumburg, Thoenes, Thurn
Patentanwälte
Postfach 86 07 48
D-81634 München (DE)

Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 4 January 1999
revoking European patent No. 0 412 751 pursuant
to Article 102(1) EPC.

Composition of the Board:

Chairman: E. Turrini
Members: M. A. Rayner
B. J. Schachenmann

Summary of Facts and Submissions

- I. The present appeal is made by the patent proprietor (appellant) against the decision of the opposition division revoking European patent No. 412 751 (application No. 90 308 633.8).
- II. In the decision under appeal, the opposition division found that the independent claims at that time under consideration offended against Article 123(2) EPC because they contained subject matter extending beyond the content of the application as filed and were rendered unclear by amended features contrary to Article 84 EPC.
- III. In the statement of appeal, the appellant requested maintenance of the patent based on amended claims and referral of the case back to the opposition division for consideration of novelty and inventive step and on an auxiliary basis oral proceedings. In the reply to the statement of appeal the respondent (opponent) requested dismissal of the appeal and on an auxiliary basis oral proceedings.
- IV. The appeal board issued a summons to oral proceedings consequent to the auxiliary requests of the parties. The board indicated that, dependent on the outcome of the discussion relating to admissibility of the amendments in the claims (Article 123(2) EPC) and clarity (Article 84 EPC), it could envisage also hearing the cases of the parties on any other outstanding issues, including novelty, inventive step

and the late filing of documents, submissions of the parties already being present in at least the first instance file. During the oral proceedings, the appellant submitted a main and auxiliary request, the wording of the independent claims of which is as follows:

Main Request

A lens having diffractive power, front (48) and back (46) focal distances, and an optical axis (16), said diffractive power being produced by a plurality of diffractive zones, produced by an optical step, characterised by a first of said diffractive zones having **an** optical step (52) with an optical height selected such that a relative phase shift of $2j\pi$ at a point on said optical axis a distance from the lens equal to said back focal distance will be introduced between two light rays of a design wavelength emanating from a point source (22) on said optical axis at a distance from said lens equal to said front focal distance and striking said lens immediately on opposite sides of said optical step of said first zone and a second of said diffractive zones, **disposed outside the first zone relative to the optical axis**, having **an** optical step (62) with an optical height selected such that a relative phase shift of $2k\pi$ at a point on said optical axis a distance from **the** lens equal to said back focal distance will be introduced between two rays of light of said design wavelength emanating from a point source (22) on said optical axis at a distance from said lens equal to said front focal distance and striking said lens immediately on opposite sides of

said optical step of said second zone, where j and k are unequal non-zero integers, **said first zone having a width equal to the width of j corresponding zones of a diffractive lens having succeeding diffractive zones, each zone becoming progressively smaller than the preceding one, and said second zone having a width equal to the width of k corresponding zones of the diffractive lens having succeeding diffractive zones, each zone becoming progressively smaller than the preceding one, the widths of the first and second zones being unequal and k being greater than j .**

(Note: Bold typeface has been added by the board for ease of identifying wording differing from claim 1 as granted)

Auxiliary Request

The auxiliary request differs from the main request by insertion of the word "kinoform" as second word (i.e. between "A" and "lens" in the first line of the main request).

- V. The arguments of the appellant can be summarised as follows.

The invention is based on finding that the outer zones of the lens may be increased in width by creating a superzone, thus overcoming the limitation on production imposed by the narrowness of the conventional zones. The whole teaching of the specification is that the second zone is disposed outside the inner where the former becomes too narrow to produce. The subject

matter claimed is supported by the documents as filed.

The sentence in lines 12 to 15 of column 5 recites that the problem of the small size of the outer zones is avoided by combining what would have been two or more zones according to prior art into a single zone and this is what is meant by "corresponding".

While the appellant appreciated the interest of the board in resolving the case as speedily as possible, the appellant nevertheless preferred to have the opportunity of presenting its case as to novelty and inventive step before two levels of jurisdiction.

VI. The respondent requested dismissal of the appeal and submitted arguments, which can be summarised as follows.

The disclosure of superzones in the patent relates to height only and not width, for example column 5, line 35 relates plainly to height, width is not mentioned. Therefore a generalisation of the invention in relation to the zone widths but relying on different zone heights does not follow from the particular disclosure of a width equal to two zones in lines 26 and 27 of column 5 of the patent.

Each zone has only one step and so far as the lens described with reference to Figure 1 is concerned, the zone geometry is defined by the equation in line 35 of column 4, wherein the role of R_0 is not clear although it could represent an offset. The claim at issue is not however clear because the word "corresponding" normally means to the skilled person that "similar or identical

given factors are present (ähnliche oder gleiche Gegebenheiten vorliegen)", yet in the present claim the criteria of correspondence in respect of the "corresponding zones of a diffractive lens" are obscure, this obscurity being further compounded by the presence of the unreferenced zone between 60 and 62 in Figure 2.

VII. At the end of the oral proceedings, the appeal board gave its decision.

Reasons for the Decision

1. The appeal complies with the provisions mentioned in Rule 65(1) EPC and is therefore admissible.

2. *Article 123 EPC*
 - 2.1 Claim 1 differs from claim 1 as granted by virtue of (1) the features after "non-zero integers," (2) the recitation that the second zone is disposed outside the first zone and (3) replacement of the references to "at least one optical step () each" by "an optical step". The word "said" has been replaced by "the" in the phrase following " $2k\pi$ ", i.e. in the phrase "a distance from the lens".

 - 2.2 The features specified in point 2.1(1) and (2) further restrict the lens claimed. "An optical step" as specified in point 2.1(3) is included within the wording "at least one optical step" and replacement of "said" by "the" amounts in both cases merely to a

reference to the antecedent basis in the claim of the feature concerned. Accordingly, the amendments made to claim 1 do not extend the scope of protection conferred and are thus in accordance with the Article 123(3) EPC.

3. The sentence in lines 31 to 33 of column 4 of the patent as granted (corresponding to column 5, lines 26 to 27 of the "A" publication) and relating to the prior art of Figure 1 recites that each zone becomes progressively smaller than the proceeding one. The reference to "diffractive lens having succeeding diffractive zones, each zone becoming progressively smaller than the preceding one" in the amended claim is a semantically precise way of expressing the procession of the progressively smaller sizes as expressed in the description.

3.1 According to the patent, manufacturing smaller zone widths further from the optical axis (column 1, lines 48 to 49 (corresponding to lines 51 to 53 in column 1 and of the "A" publication)) is hard. The problem is again addressed in column 4, lines 41 to 46 (column 5, lines 36 to 41 of the "A" publication) where it is recited that because of the extremely small size of such outer zones it is very difficult to manufacture them. The problem of small size is taught in lines 12 to 15 of column 5 (lines 8 to 11 of column 6 of the "A" publication) as being avoided by combining what would have been two or more (emphasis added by the board) zones according to the prior art into a single zone. The patent introduces the word superzone for a combined single zone corresponding to more than one zone of a prior art lens (column 5, lines 21 to 23 (lines 18 to 20 of column 6 of the "A" publication)). It not

disputed by the parties that it is explicit from lines 25 to 29 of column 5 of the patent (corresponding to lines 22 to 26 in column 6 of the "A" publication) that, in the case of two zones, the width of the single combined zone is that of two uncombined zones. In the patent this is expressed as each of the zones (the combined single or superzones) having a width equal to two zones of a prior art lens and steps having an optical height equal to two times the design wavelength. A superzone corresponding to three diffractive zones (column 5, line 35 of the detailed description (corresponding to lines 26 to 27 of the "A" publication)) of a prior art lens is then explained as having an optical height equal to three times the design wavelength. Although no specific recitation of the width of this superzone is given, the skilled person derives directly and unambiguously from the recitation of two or more and the entire thrust of the patent application as filed relating to the combined or superzones overcoming the problem of a too small width, that the width of this superzone is indeed that of three zones of a prior art lens. This relationship is directly and unambiguously derivable for larger numbers than three by virtue of the term "or more" and for example column 6, lines 11 to 13 (lines 10 to 13 of column 7 of the "A" publication) reciting that there is no requirement that superzones cannot be associated with more than three prior art zones. Accordingly, the skilled person derives the features specified in 2.1(1) and (2) above directly and unambiguously from the documents as filed.

3.2 Since a zone comprises one optical step in the embodiment of the invention, the skilled person derives

the feature concerning an optical step (see point 2.1(3) above) directly and unambiguously from the documents as filed. No substantive change is added by the changing of "said" to "the". The remaining unamended features of the claim derive for example from claim 10 as filed.

3.3 Therefore, the board is convinced that the skilled person derives the subject matter of claim 1 of the main request directly and unambiguously from the documents as filed and that therefore the requirement of Article 123(2) is satisfied.

4. *Article 84 EPC*

4.1 In its present wording, claim 1 recites clearly that a zone has an optical step. The diffractive lens is claimed with reference to a diffractive lens having succeeding diffractive zones, each zone becoming progressively smaller than the preceding one. The equation in line 35 of column 4 is not however present in the claim and therefore its parameter R_0 is not relevant to clarity of the amendments effected to the claim.

4.2 The understanding of the respondent ("similar or identical given factors are present") concerning the wording "a width equal to the width of j corresponding zones of a diffractive lens" is in line with the teaching of the patent specification (see point 3.2 above) and thus, after amendment of the claim, does not give rise to obscurity of the criterion "width" as taught by the documents as filed.

4.3 While there are some errors in nomenclature and numbering in the description of the patent specification (see for example the references 70, 72 and 74 in lines 29 to 34 of column 5 of the description (corresponding to lines 26 to 31 of column 5 of the "A" publication) or the omission of a reference numeral for the zone between 60 and 62 in Figure 2), these errors do not detract from an understanding of the description by the skilled person consistent with the claims having regard to the whole of the patent application as filed.

4.4 Therefore the board is satisfied that claim 1 as amended is clear within the meaning of Article 84 EPC.

5. *Article 111 EPC*

5.1 The present decision concerns only claim 1 of the main request. Since neither issues relating for example to novelty or to inventive step nor even relating to any possible further amendment of the claims have been addressed, it is appropriate to exercise the discretion of the Board under Article 111(1) EPC and to remit the case back to the first instance, in particular so as to allow the cases of the parties in relation to all remaining issues in the present case to be examined at two levels of jurisdiction and thus not to deprive the parties of one such level of jurisdiction.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the first instance for further prosecution on the basis of claim 1 according to the main request.

The Registrar:

The Chairman:

P. Martorana

E. Turrini