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**Datasheet for the decision
of 6 February 2007**

Case Number: T 0471/05 - 3.4.02

Application Number: 98932446.2

Publication Number: 0932845

IPC: G02B 13/08

Language of the proceedings: EN

Title of invention:

An optical system restraining aberrations within the maximum imaging volume

Applicant:

Koninklijke Philips Electronics N.V., et al

Opponent:

-

Headword:

-

Relevant legal provisions:

EPC Art. 52(1), 52(2), 52(3), 54, 56

Keyword:

"Entitlement to patent protection of a method of designing an optical system: main and first auxiliary requests (no: subject-matter for which protection is sought not confined to physical, technical implementations) - second auxiliary request (yes)"

"Novelty and inventive step - second auxiliary request (yes)"

Decisions cited:

G 0001/03, T 0453/91, T 0953/94, T 1173/97, T 0619/02,
T 0914/02, T 0258/03, T 0388/04, T 0930/05

Catchword:

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Case Number: T 0471/05 - 3.4.02

D E C I S I O N
of the Technical Board of Appeal 3.4.02
of 6 February 2007

Appellant: Koninklijke Philips Electronics N.V.
Groenewoudseweg 1
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Representative: van der Veer, Johannes Leendert
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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 16 November 2004
refusing European application No. 98932446.2
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: A. G. Klein
Members: F. J. Narganes-Quijano
C. Rennie-Smith

Summary of Facts and Submissions

I. The appellant (applicant) lodged an appeal against the decision of the examining division to refuse European patent application No. 98932446.2, filed as International publication No. PCT/IB98/01124 and published as WO 99/09446.

In the decision under appeal the examining division held that the subject-matter of claim 1 then on file was not novel (Articles 52(1) and 54 EPC) over the disclosure of document

D1: "The ray and wave theory of lenses" A. Walther, Cambridge Studies in Modern Optics, Cambridge University Press, 1995; pages 358 to 363,

and that in any case the claimed subject-matter did not involve an inventive step (Articles 52(1) and 56 EPC) in view of the antagonistic Herschel and Abbe conditions for optical systems well known in the field of optical design.

II. In the statement setting out the grounds of appeal the appellant referred to document

D2: "Principles of optics" M. Born *et al.*, Pergamon Press, 6th corrected edition, 1980, UK; pages 166 to 169,

and requested setting aside of the decision and the grant of a patent.

III. In a communication annexed to the summons to attend oral proceedings and in a subsequent communication dated 11.01.2007, the Board gave a preliminary assessment of the case and expressed its preliminary opinion that a method of designing an optical system as defined in the claims then on file did not appear to define a technical invention susceptible of patent protection under Articles 52(1) to (3) EPC.

IV. Oral proceedings were held before the Board on 06.02.2007. The appellant requested the grant of a patent on the basis of one of the following sets of amended claims:

- main request: claims 1 to 4 as filed with the statement of grounds of appeal and claims 5 to 14 of the main request filed with its letter dated 21.12.2006,
- first auxiliary request: claims 1 to 14 of the main request filed with the letter dated 21.12.2006,
- second auxiliary request: claims 1 to 14 filed at the oral proceedings, and
- third auxiliary request: claims 1 to 10 of the auxiliary request filed with the letter dated 21.12.2006,

together with pages 2 and 3 of the description filed with the letter dated 21.12.2006 and pages 1 and 4 to 14 of the description and the drawing sheets as published.

At the end of the oral proceedings the Board gave its decision.

V. Claim 1 of the appellant's main request reads as follows:

"A method for designing an optical system having an optical axis and imaging a point P to a point P', both on the optical axis, characterized in that the method comprises a step of making a design of the optical system, in which substantially all rays from P to P' satisfy the condition

$$n \sin \left[\frac{\alpha}{q} \right] = \beta' n' \sin \left[\frac{\alpha'}{q} \right]$$

where α and α' are the angles of one of the rays with the optical axis at P and P' respectively, n and n' are the refractive indices at P and P' respectively, β' is the lateral magnification factor between P and P', and q is a constant complying with $1 < q < 2$."

In the first auxiliary request claim 1 differs from the main request in that the introducing phrase "A method for designing an optical system ..." is replaced by the phrase "A method, other than a method for performing a mental act as such, for designing an optical system ...".

In the second auxiliary request claim 1 differs from the main request in that the closing phrase "a constant complying with $1 < q < 2$ " is replaced by the phrase "a constant complying with $1 < q < 2$, the method using an optics design program".

Each of the main and the first and second auxiliary requests includes an independent claim 5 and an independent claim 9 reading as follows:

"5. A method for manufacturing an optical system, the method comprising:

a first step of designing the optical system having an optical axis and imaging a point P to a point P', both on the optical axis, and

a second step of making the optical system according to the design, characterized in that according to the design substantially all rays from P to P' satisfy the condition

$$n \sin \left[\frac{\alpha}{q} \right] = \beta' n' \sin \left[\frac{\alpha'}{q} \right]$$

where α and α' are the angles of one of the rays with the optical axis at P and P' respectively, n and n' are the refractive indices at P and P' respectively, β' is the lateral magnification factor between P and P', and q is a constant complying with $1 < q < 2$."

"9. An optical system for imaging a point P to a point P', both on the optical axis, and having an optical axis, characterized in that substantially all rays from P to P' satisfy the condition

$$n \sin \left[\frac{\alpha}{q} \right] = \beta' n' \sin \left[\frac{\alpha'}{q} \right]$$

where α and α' are the angles of one of the rays with the optical axis at P and P' respectively, n and n' are the refractive indices at P and P' respectively, β' is the lateral magnification factor between P and P', and q is a constant complying with $1 < q < 2$."

The second auxiliary request also includes dependent claims 2 to 4, 6 to 8 and 10 to 14 referring back to independent claims 1, 5 and 9, respectively.

The wording of the claims according to the third auxiliary request is not relevant for the present decision.

VI. The arguments of the appellant in support of its requests can be summarised as follows:

Claim 1 of the main request defines a method of designing an optical system satisfying a predetermined condition. Therefore, the claim defines an activity that involves technical considerations, requires the use of technical means, results in an optical system design, produces technical information in the form of the specifications of an optical system having predetermined technical characteristics, and pertains to the technical field of optical design. Therefore, all aspects of the claimed invention are technical and, following decision T 619/02, the claimed invention is a technical invention not excluded from patentability.

In addition, according to the established case law a computer program is not excluded from patentability when the program involves technical considerations, and in particular when the program solves a technical problem or achieves a technical effect so that, by analogy, a method of design as claimed and involving technical considerations should also be patentable.

Claim 1 of the first auxiliary request comprises a disclaimer disclaiming methods for performing a mental

act as such. The disclaimer disclaims solely subject-matter which, under Articles 52 to 57 EPC, is excluded from patentability for non-technical reasons and is allowable according to decision G 1/03, headnote II.1, third item. The claimed method can be carried out by means of a computer program, or be directly implemented in optical material being shaped so as to satisfy the claimed conditions. The amendment overcomes any objection of excluded subject-matter raised with regard to claim 1 of the main request.

Claim 1 of the second auxiliary request is restricted to the implementation of the design method by means of a computer program and therefore requires a technical implementation.

Document D1 proposes a lens that optimizes a variety of incompatible tasks (page 358, lines 9 and 10, and lines 23 to 31). The lens is defined in terms of an eikonal $V(x,y,L',M')$ which, according to equations 31.50 to 31.53 of the document, is expressed in terms of adjustable parameters A_1 to A_8 to be determined by minimizing a merit function (page 358, lines 13 to 19) so that the wave front errors within the focal volume are small (page 359, third paragraph). The lens proposed in document D1 is therefore different from the optical system resulting from the method of claim 1 and involving one single parameter q . In particular, there is no indication that the eikonal proposed in document D1 would result in a lens satisfying the claimed conditions. Thus, document D1 proposes a solution to the problem of increasing the focal volume of a lens as also considered in the application, but does not disclose the claimed solution.

In addition, it is well known that, except when the magnification β' is equal to n/n' , the Herschel and the Abbe conditions are incompatible, and the prior art does not disclose or suggest how a compromise between the Herschel and the Abbe conditions might look in order to balance the effects of obtaining a relatively large field of view and an optical quality which is relatively insensitive to changes in the magnification. The skilled person would be confronted by many different possibilities. To focus only on one-parametric interpolations, the skilled person may consider for instance the following possibilities among numerous other alternatives:

$$pn \sin \alpha + (1-p)n \sin \alpha/2 = p\beta'n' \sin \alpha' + (1-p)\beta'n' \sin \alpha'/2$$

$$n \sin \alpha/2 (2\cos \alpha/2)^p = \beta'n' \sin \alpha'/2 (2\cos \alpha'/2)^p.$$

All these possibilities interpolate between the Herschel and the Abbe conditions (both conditions reproduce the Herschel condition when $p = 0$ and the Abbe condition when $p = 1$), but none have the improvements associated with the claimed condition, i.e. rendering possible the design of an optical system whose optical quality is relatively insensitive to changes of the magnification while still having a relatively large field of view. The prior art contains no suggestion of the parameterization of the Abbe and the Herschel conditions according to the invention.

Reasons for the Decision

1. The appeal is admissible.

2. *Main request - Claim 1*

- 2.1 Claim 1 of the main request is directed to a method of designing an optical system, the method consisting essentially in designing the optical system so that substantially all light rays imaged by the optical system between two predetermined points on the optical axis of the system satisfy the algebraic condition specified in the claim.

Thus, the claim merely formulates a series of mathematical and optical abstract concepts without properly requiring a physical, technical implementation. In particular, neither the claimed design method nor the resulting "design" requires a technical activity or a technical entity - let alone a "physical" activity or entity within the meaning of decision T 453/91 (point 5.2 of the reasons). It follows that the subject-matter for which protection is sought (Article 84 EPC, first sentence) is the mere "design" of an optical system and encompasses purely abstract and conceptual implementations excluded from patent protection pursuant to Articles 52(1), (2) and (3) EPC. More particularly, the claimed method can be carried out as a purely mental act or as a purely mathematical design algorithm and, consequently, encompasses embodiments falling within the category of methods for performing mental acts as such and within the category of mathematical methods as such both expressly excluded

from patent protection under Article 52(2)(a) and (c) in conjunction with Article 52(3) EPC.

2.2 According to the main line of argument of the appellant, the claimed method defines an activity that requires the use of technical means, involves technical considerations, results in an optical system design and produces technical information in the form of the specifications of an optical system having predetermined technical characteristics, and pertains to the technical field of optical design; therefore, according to decision T 619/02 (OJ EPO 2007, 63), point 2.2 of the reasons, the claimed invention has technical character and is thus entitled to patent protection.

However, this line of argument does not persuade the Board. The criteria for technical character of a claimed invention discussed in decision T 619/02 implicitly presuppose that the claimed subject-matter defining the matter for which protection is sought relates to a physical entity or a physical activity (see for instance point 2.1, first paragraph, and points 2.3.1, 2.4.1 of the decision). It cannot be denied that the method defined in claim 1 of the main request can be carried out using some physical means (e.g. a block of optical material to be gradually shaped into an optical system so as to satisfy the algebraic condition specified in the claim), or using some technical means (e.g. a computer to determine the optical specifications of the optical system design), or in the form of a physical activity that results in a physical entity (e.g. when the claimed step of "making a design of the optical system" is implemented by the

manufacture of the design as actually claimed in claim 5), and that such implementations of the claimed method constitute physical, technical activities not excluded from patent protection (see for instance decisions T 914/02, point 2.3.3 of the reasons, and T 258/03, OJ EPO 2004, 575, point 4.7). Nonetheless, contrary to the appellant's contention, the claimed method does not require the use of technical means and, as noted above, the method is not restricted to physical, technical implementations, and the fact that the claimed method encompasses non-excluded implementations such as those mentioned above does not overcome the fact that the claimed method also encompasses excluded subject-matter (T 914/02, points 2 and 3, and T 388/04, OJ EPO 2007, 16, point 3 of the reasons; see also T 453/91, point 5.2, and T 930/05, points 3.1 and 4.5). Thus, as long as the claimed design method is not confined to physical, technical implementations, the claimed subject-matter encompasses embodiments excluded from patentability under Articles 52(1) to 52(3) EPC and is not entitled to patent protection under the EPC.

In addition, the claimed method involves conceptual technical considerations in the sense that the claim refers to an optical system having predetermined optical characteristics. However, the mere presence in the claim of such purely conceptual technical considerations does not overcome the conclusion above that the claim merely formulates a sequence of mathematical and optical concepts without properly requiring a technical or even a physical implementation. In particular, a purely mental implementation of the claimed method remains a mental act as such within the

meaning of Articles 52(2) and (3) EPC even if the mental act involves conceptual technical considerations as already concluded in decision T 914/02 in which a method claim involving technical considerations and encompassing technical embodiments (point 3 of the reasons of the decision) was refused on the grounds that the invention as claimed could still be exclusively performed by purely mental acts (point 2.3 of the reasons).

Similar considerations apply to the appellant's arguments that the claimed method results in an optical design and in technical information, and pertains to the technical field of optical design. As long as the claimed method encompasses purely abstract implementations resulting in information consisting of purely abstract or conceptual "designs", the claimed subject-matter only defines a conceptual teaching without however requiring a physical, technical implementation in the technical field of optical design for which protection can be sought under the EPC (T 453/91, point 5.2 of the reasons, T 953/94, point 5.2, and T 930/05, points 3 and 3.1).

- 2.3 The further line of argument of the appellant that a method of design as claimed and involving technical considerations should be patentable by analogy to the established case law relating to the non-exclusion from patentability of computer programs satisfying predetermined conditions cannot be accepted by the Board. The argument "by analogy" of the appellant presupposes that the exclusions from patent protection listed in Article 52(2) EPC all belong to a same conceptual class of entities and activities all

excluded from patentability for a common reason and that consequently all the exclusions should be treated in an analogous manner. However, the present Board cannot share the appellant's assumption in this respect. Not all the different entities and activities listed in Article 52(2) EPC are excluded from patent protection for the same conceptual and historical reasons and under the same considerations of public policy. In addition, the particular rationale underlying the case law on computer-implemented inventions (see for instance T 1173/97, OJ EPO 1999, 609, points 5.5, 6 and 9 of the reasons) cannot be directly applied to each of the remaining exclusions (see T 914/02, point 2.3.6 of the reasons).

2.4 In view of the above - and unlike independent claims 5 and 6 respectively directed to the manufacture of an optical system and to an optical system and therefore both confined to physical, technical implementations susceptible of patent protection - the subject-matter defined in claim 1 of the main request is excluded from patent protection under Articles 52(1), (2) and (3) EPC.

3. *First auxiliary request - Claim 1*

Claim 1 of the first auxiliary request differs from claim 1 of the main request in that the claim is directed to "a method, other than a method for performing a mental act as such". The application as published does not contain any reference to (the exclusion of) mental acts, and in this regard the aforementioned feature constitutes a disclaimer introduced in the claim in order to exclude subject-

matter not eligible for patent protection pursuant to Article 52(2) (c) in conjunction with Article 52(3) EPC.

However, assuming that the disclaimer is admissible within the meaning of decision G 1/03 (OJ EPO 2004, 413), points 2.4, 2.6.5 and 3 of the reasons and, in particular, assuming that the amended claim containing the disclaimer satisfies the requirements of Article 84 EPC (G 1/03, point 3 of the reasons), the amended claim would then overcome the particular objection raised in point 2 above relating to the claimed subject-matter encompassing methods for performing mental acts as such, but would not overcome the main objection that the claimed subject-matter is not confined to physical, technical implementations and encompasses purely abstract implementations - such as a purely mathematical design algorithm excluded from patent protection pursuant to Articles 52(2) (a) and 52(3) EPC.

Having regard to the above - and irrespective of the issue of the admissibility of the disclaimer - the subject-matter defined in claim 1 of the first auxiliary request is excluded from patent protection under Articles 52(1), (2) and (3) EPC.

4. *Second auxiliary request*

4.1 *Claim 1 - Entitlement to patent protection*

Claim 1 of the second auxiliary request differs from claim 1 of the main request in that the claimed method is carried out "using an optics design program". This amendment is based on the passage on page 3, third paragraph of the description according to which

"several optics design programmes can vary the value of the parameter q in order to achieve certain design goals [...]". Thus, claim 1 of the second auxiliary request defines an activity in which the design conditions defined in the claim are input into an optics design program to determine the design parameters of optical systems satisfying the design conditions expressed in the claim. In addition, the determination by the optics design program of the resulting design specifications requires implicitly that the optics design program is run in some form of hardware such as a computer. It follows that the claimed method defines an activity involving inherently and necessarily the use of such hardware fed with the optics design program and the claimed design conditions, i.e. defines a physical, technical activity.

Accordingly, claim 1 amended according to the second auxiliary request overcomes the objections raised under Articles 52(1), (2) and (3) EPC in point 2 above with regard to claim 1 of the main request and the claimed subject-matter is entitled to patent protection under the EPC.

4.2 *Claim 1 - Novelty*

- 4.2.1 Document D1 proposes the design of a lens optimizing, on average, its imaging aberration correction performances (page 358, second and third paragraphs). The lens is described by a point angle eikonal function $V(x,y,L',M')$ having, according to the algebraic expressions (31.50) to (31.53) of the document, the following power series expansion:

$$V(x,y,L',M') = b + a/100 + A_1 ac + A_2 ac^2 + A_3 bc + \\ + A_4 bc^2 + A_5 b^2 + A_6 b^2c + A_7 c^2 + A_8 c^3$$

where a, b and c stand for $1/2 (x^2 + y^2)$, $xL' + yM'$ and $1/2 (L'^2 + M'^2)$, respectively. The coefficients A_1 to A_8 are parameters to be determined by minimizing the RMS (root mean square) wavefront error indicative of wavefront aberrations within the imaging spherical volume (page 358, third paragraph and page 359, first and second paragraphs).

In addition, the document specifies that in the proposed lens design the nominal magnification is set to unity at the centre of the imaging spherical volume (page 358, penultimate paragraph), and that at this centre point both the Abbe and the Herschel conditions can be simultaneously satisfied (page 358, last paragraph). The document further specifies that a compromise should be established between the different design conditions (page 361, second paragraph).

4.2.2 Claim 1 is directed to the design, by means of an optics design program, of an optical system such that substantially all the light rays between two points of the optical axis satisfy the algebraic condition specified in the claim for a constant, i.e. for a predetermined value of the parameter q satisfying $1 < q < 2$. The algebraic condition reproduces for $q = 1$ the well known Abbe (or sine) condition

$$n \sin (\alpha) = \beta' n' \sin (\alpha') \quad [1]$$

guaranteeing a large imaging field of view, and for $q = 2$ the well known Herschel condition

$$n \sin (\alpha/2) = \beta' n' \sin (\alpha'/2) \quad [2]$$

guaranteeing sharp images independently of the magnification (see document D2, section 4.5). In addition, it is also well known that, except in the particular case in which the value of the magnification is equal to the ratio of the refractive indices of the object and the image spaces, these two conditions cannot be satisfied simultaneously (see for instance document D2, page 169, last paragraph of section 4.5.2). Since the claim requires that $1 < q < 2$, neither the Abbe nor the Herschel condition is satisfied by the optical system designed according to the claimed method. The designed optical system rather satisfies a condition interpolating the Abbe and the Herschel conditions, so that the design represents a compromise between these two antagonistic conditions.

- 4.2.3 In the decision under appeal the examining division held that the design approach proposed in document D1 already establishes a compromise between the Abbe and the Herschel condition in the imaging spherical volume and yields good results as reported in Table 31.3 of the document, and concluded that the lens disclosed in document D1 has the same optical specifications and performances as the optical design of claim 1, so that the optical system of document D1 should also comprise the same technical features as the claimed design.

However, the Board is not able to agree with the view of the examining division in this respect. It cannot be denied that the optimization approach proposed in document D1 results in a lens design which also

represents a certain compromise between the Abbe and the Herschel conditions and which also presents good optical performances. However, contrary to the examining division's view, this fact alone is not sufficient to conclude that the design proposed in document D1 anticipates the design defined in claim 1 as there is no evidence that the former would result in a lens having the same optical performances, let alone the same optical specifications as an optical system satisfying the claimed design conditions. On the contrary, as submitted by the appellant, the design approach followed in document D1 relies on the determination of not just one, as in the claimed invention, but of eight different parameters A_1 to A_8 . In addition, while in document D1 the eight parameters are adjusted in order to minimize the root mean square wavefront error (page 359, penultimate paragraph), according to the present application the claimed design is selected specifically to optimize field size and axial excursion (page 3, lines 15 to 18), i.e. the present application and document D1 follow different aberration correction optimization criteria in the design of the optical system. Accordingly, document D1 proposes a different analytical approach and a different optical aberration correction optimization procedure to that defined in the claimed subject-matter and, even if it were assumed for the sake of argument that the approach proposed in document D1 and the claimed design approach would be equivalent to the extent that the claimed design would be obtainable as a particular optimization of the approach proposed in document D1, this particular optimization would be neither explicitly disclosed nor implicitly

derivable in a clear and unambiguous manner from the disclosure of the document.

In view of the above, the Board concludes that the design procedure proposed in document D1 does not anticipate the claimed design and that the claimed method is novel over the disclosure of document D1 (Articles 52(1) and 54 EPC).

4.3 *Claim 1 - Inventive step*

The objection of lack of inventive step raised by the examining division in the decision under appeal relies on the fact that, except when the magnification value is n/n' , the Abbe and the Herschel conditions cannot be satisfied simultaneously, thus rendering impossible the simultaneous optimization of the field of view and the magnification span of an optical system. The examining division concluded that a skilled person confronted with the problem of simultaneously optimizing the field of view and the magnification span will automatically try to use a value of q different from 1 and 2, i.e. a compromise between the Abbe and the Herschel conditions.

The Board, however, cannot follow the conclusion drawn by the examining division. First, the line of argument of the examining division relies on a parameter q algebraically interpolating between the Abbe and the Herschel conditions, i.e. relies on hindsight knowledge of the specific algebraic condition defined in the claimed invention and therefore on an *ex post facto* analysis. Second, even assuming that the skilled person would have considered the possibility of obtaining a compromise between the two antagonistic conditions

different from that proposed in document D1, the Board notes that there is an infinite number of ways of reaching a compromise between the two conditions. In particular, there is an infinite number of mathematical functions interpolating between the two algebraic conditions [1] and [2]; even restricting such interpolating functions to parametric functions, there is an infinite number of such interpolating parametric functions, the one-parameter algebraic interpolations given by the appellant in the statement of grounds of appeal (see point V above) constituting just some examples. In fact, there are even infinite ways of compromising the two conditions with the algebraic function defined in the claim when - contrary to the requirements of the claimed design - the condition is only satisfied by some light rays, or by substantially all light rays but with different values of the parameter q .

In addition, the algebraic condition defined in the claimed invention does not constitute an arbitrary selection of just one from among infinite possibilities of mathematically interpolating between conditions [1] and [2], but, according to the disclosure of the invention, the claimed condition constitutes the selection of a specific mathematical interpolation that guarantees the achievement of an advantageous balance between field size and axial excursion (page 3, lines 15 to 25), thus allowing for a relatively large volume in image space where aberrations stay relatively low (pages 9 to 12 of the application).

In view of the above, neither the available prior art nor the general common knowledge in this field suggest

the design requirements defined in claim 1 and the technical improvements achieved therewith. The Board concludes that the claimed subject-matter is not obvious within the meaning of Article 56 EPC.

4.4 *Claims 2 to 14*

Independent claim 5 is directed to a method of manufacture of an optical system including the step of designing the optical system as defined in claim 1, and independent claim 9 is directed to an optical system satisfying the design conditions defined in claim 1. In addition, claims 2 to 4, 6 to 8 and 10 to 14 are dependent on claims 1, 5 and 9, respectively. In view of the reasons already given in points 4.2 and 4.3 above with regard to the subject-matter of claim 1, the Board concludes that the subject-matter of claims 2 to 14 is also novel and involves an inventive step (Articles 52(1), 54 and 56 EPC).

4.5 The Board is also satisfied that the application documents amended according to the second auxiliary request of the appellant and the invention to which they relate meet the remaining requirements of the EPC within the meaning of Article 97(1) EPC. In particular, claim 1 is based on claim 1 as published and the passage on page 3, third paragraph of the description as published, claims 2 and 6 are based on page 13, lines 16 to 17 and section 2.2 of the description, claims 3, 7 and 11 are based on the equations (19) and (21) and the corresponding description, claims 4, 8 and 10 are based on claim 2 as published, claims 5, 9, 12 and 14 are respectively based on claims 3, 4, 5 and 7 as published, and claim 13 is based on claims 4 and 6

as published (Article 123(2) EPC). As regards the description, the statements of the invention on pages 2 and 3 have been brought into conformity with the claimed invention (Article 84 and Rule 27(1) (c) EPC).

5. In view of the above considerations, the Board concluded during the oral proceedings that the decision under appeal is to be set aside and a patent be granted on the basis of the application documents amended according to the second auxiliary request of the appellant (Articles 97(2) and 111(1) EPC).

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 grant a patent on the basis of the following application documents:
 - claims 1 to 14 of the second auxiliary request filed at the oral proceedings,
 - description pages 1 and 4 to 14 as published and pages 2 and 3 filed with the letter of 21 December 2006, and
 - drawing sheets 1/2 and 2/2 as published.

The Registrar:

The Chairman:

M. Kiehl

A. G. Klein