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**Datasheet for the decision
of 24 September 2012**

Case Number: T 1606/08 - 3.4.01

Application Number: 00954782.9

Publication Number: 1206303

IPC: A61N 5/067

Language of the proceedings: EN

Title of invention:

Molecular resonance stimulated by low intensity laser light

Applicant:

Strachan, John Scott

Headword:

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Relevant legal provisions (EPC 1973):

EPC Art. 84

Keyword:

"Claims - clarity (no)"

Decisions cited:

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Catchword:

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Case Number: T 1606/08 - 3.4.01

D E C I S I O N
of the Technical Board of Appeal 3.4.01
of 24 September 2012

Appellant: Strachan, John Scott
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Representative: Murnane, Graham John
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Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 21 February 2008
refusing European patent application
No. 00954782.9 pursuant to Article 97(2) EPC.

Composition of the Board:

Chairman: G. Assi
Members: F. Neumann
J. Geschwind

Summary of Facts and Submissions

- I. The appeal, filed on 10 April 2008, lies from the decision of the examining division, dispatched on 21 February 2008, to refuse European patent application number 00 954 782.9. The appeal fee was paid on 10 April 2008. The statement setting out the grounds of appeal was filed on 27 June 2008.
- II. The examining division refused the application because independent claims 1, 10 and 11 of the main request and independent claims 1 and 10 of the first auxiliary request were unclear (Article 84 EPC 1973) and independent claims 1 and 10 of the second auxiliary request did not meet the requirements of Article 123(2) EPC. With regard to the lack of clarity, the examining division held, *inter alia*, that the terms "*substantial Fresnel zone*" and "*substantial majority*" were unclear.
- III. In the statement setting out the grounds of appeal the appellant submitted three sets of amended claims forming the basis of a main request, a first auxiliary request and a second auxiliary request. It was argued that the terms "*substantial Fresnel zone*" and "*substantial majority of destructive nodes*" were clear both *per se* and in the context in which these terms were used. In support of this view, a witness statement was filed in which the witness, Mr Trevor Whittle, explained how he understood the wording used in the claims.
- IV. On 30 April 2012 the Board issued a summons to oral proceedings. In a communication dated 01 June 2012 issued in preparation of oral proceedings, the Board

indicated in particular that it considered the terms "*substantial Fresnel zone*" and "*substantial majority of destructive nodes*" to be unclear (Article 84 EPC 1973). Moreover, the Board set out the preliminary opinion that the application 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 (Article 83 EPC 1973).

V. With letter of 24 August 2012, the appellant indicated that he would not be represented at the oral proceedings and requested a decision according to the state of the file. The requests, as set out in the statement setting out the grounds of appeal, were maintained. The final requests were therefore that the decision be set aside and that a patent be granted on the basis of claims 1 to 11 of the main request, claims 1 to 10 of the first auxiliary request or claims 1-10 of the second auxiliary request, all these requests having been filed with the statement setting out the grounds of appeal.

VI. At the oral proceedings, which were held on 24 September 2012 in the appellant's absence, the decision to dismiss the appeal was announced.

VII. The **main request** contains three independent claims.

Claim 1 of the main request reads as follows:

"Apparatus for the stimulation of molecular resonance by the application of very low intensity electromagnetic radiation, the apparatus comprising:

a laser of multiple line cavity resonance comprising a laser diode with a collimated or near collimated beam; a phase cancellation optical element through which said beam is passed, the phase cancellation optical element having the characteristic of cancelling several of the central lines of the laser frequency while leaving the higher and lower frequencies generally uncanceled, such that the beat frequencies of the passed frequencies forms a pattern of interference of constructive and destructive nodes; the diameter of the beam being set to be a sufficient multiple of the wavelength equivalent to the beat frequency to allow a substantial Fresnel zone to be apparent in the beam; an aperture which selects a portion of the Fresnel zone wherein a substantial majority of destructive nodes is apparent relative to the constructive nodes; and means for modulating the laser frequency."

Claim 10 of the main request reads as follows:

"A method of stimulation of molecular resonance by the application of very low intensity electromagnetic radiation modulated at resonant frequencies of molecules of high Q, the method comprising: forming a collimated or near-collimated beam by use of a laser of multiple line cavity resonance comprising a laser diode; passing said beam through a phase cancellation optical element which has the characteristic of cancelling several of the central lines of the laser frequency while leaving the higher and lower frequencies generally uncanceled such that the beat frequency of

the passed frequencies forms a pattern of constructive and destructive nodes;
setting the diameter of the beam to be a sufficient multiple of the wavelength of the beat frequency to allow a substantial Fresnel zone to be apparent in the beam;
selecting, by means of an aperture, a portion of the Fresnel zone in which a substantial majority of the destructive nodes is apparent relative to the constructive nodes; and
modulating the laser frequency;
but excluding use of the method in vivo for therapy or diagnosis."

Claim 11 of the main request reads as follows:

"Apparatus for the production of sub-picosecond light pulses, the apparatus comprising:
a laser producing a collimated or near-collimated beam;
a phase cancellation optical element through which said beam is passed, the phase cancellation optical element being formed by the series combination of a first diffraction grating, a refractive element, and a second diffraction grating;
whereby a pattern of interference of constructive and destructive nodes is formed;
the diameter of the beam being set to be a sufficient multiple of the wavelength equivalent to the beat frequency to allow a substantial Fresnel zone to be apparent in the beam; and
means for pulsing the laser with pulses of sufficiently short duration to produce for each pulse an isolated traverse through the frequency mode of the laser."

Claims 2-9 of the main request are dependent claims.

The **first auxiliary request** contains two independent claims.

Claim 1 of the first auxiliary request is identical to claim 1 of the main request except that the wording "*by the application of very low intensity electromagnetic radiation*" in the first lines of claim 1 of the main request has been removed and the wording "*whereby molecular resonance may be induced by the application of very low intensity electromagnetic radiation.*" has been added to the end of the claim.

Claim 10 of the first auxiliary request is the same as claim 10 of the main request except that the wording "*in inanimate material*" has been inserted into the first line of the claim after "*A method of stimulation of molecular resonance*" and the wording "*but excluding use of the method in vivo for therapy or diagnosis*" has been removed from the end of the claim. Moreover, the wording "*whereby said molecular resonance can be induced with a very low intensity of said electromagnetic radiation.*" has been added to the end of the claim.

Claims 2 to 9 of the first auxiliary request are dependent claims.

The **second auxiliary request** contains two independent claims.

Claim 1 of the second auxiliary request reads:

"Apparatus for the stimulation of molecular resonance by the application of very low intensity electromagnetic radiation, the apparatus comprising: a laser of multiple line cavity resonance comprising a laser diode with a collimated or near collimated beam; a phase cancellation optical element through which said beam is passed, the phase cancellation optical element having the characteristic of cancelling several of the central lines of the laser frequency while leaving the higher and lower frequencies generally uncanceled, such that the beat frequencies of the passed frequencies forms a pattern of interference of constructive and destructive nodes in a Fresnel zone defined as a function of an aperture through which said beam has passed; the diameter of the beam being set to be a sufficient multiiple (sic) of the wavelength equivalent to the beat frequency to allow said Fresnel zone to be apparent in the beam such that said pattern of interference extends at least through a desired spatial volume; an aperture which selects a portion of the Fresnel zone wherein a substantial majority of destructive nodes is apparent relative to the constructive nodes; and means for modulating the laser frequency."

Claim 10 of the second auxiliary request is identical to claim 10 of the main request.

Claims 2 to 9 of the second auxiliary request are dependent claims.

VIII. The arguments of the appellant, insofar as they are pertinent to the present decision, are set out below in the reasons for the decision.

Reasons for the Decision

1. The appeal is admissible.

2. Main request

2.1 Independent claims 1, 10 and 11 lack clarity (Article 84 EPC 1973) due to the use of the term "*substantial*" in these claims.

This term appears in all three independent claims but for the purposes of the present decision the Board will concentrate on only independent claim 10 which refers to a "*substantial Fresnel zone*" and a "*substantial majority of the destructive nodes*".

2.2 Meaning of "*substantial*"

The term "*substantial*" is used in claim 10 as a relative term to define the size of the Fresnel zone and to define the size of the majority of destructive nodes relative to constructive nodes. Although it is evident that this term is intended to mean "*large*", the Board considers the term "*substantial*" to be indeterminate since it is not clear when something may be considered to be "*substantial*" (i.e. large) or "*less than substantial*" (i.e. small). In other words, the boundary beyond which something may be considered to be

"*substantial*" is neither clearly defined nor well-recognised.

The appellant indicated in the statement setting out the grounds of appeal, that "*substantial*" generally meant "*of significant size*".

The Board notes however that in the same way that the boundary between substantial and less than substantial is indeterminate, so also is the boundary between significant and insignificant. This explanation therefore suffers from the same lack of clarity as the term it purports to explain.

2.3 Meaning of "*substantial Fresnel zone*"

2.3.1 The meaning of "*substantial*" does not become clear from the context in which it is used in the method claim 10. In particular, claim 10 includes the method step of "*setting the diameter of the beam to be a sufficient multiple of the wavelength of the beat frequency to allow a substantial Fresnel zone to be apparent in the beam*".

In the statement setting out the grounds of appeal, the appellant pointed out that the method claim further required that a portion of the Fresnel zone be selected by an aperture. In view of this, it was submitted that in the specific context of the method claim, "*a substantial Fresnel zone*" meant that the Fresnel zone must be "*sufficiently large to enable a portion off (sic) the Fresnel zone to be selected by an aperture of practicable size.*"

The Board understands this explanation to mean that the near-field region of the diffraction pattern must be long enough to allow an aperture to be inserted in the near-field region. This meaning is however not clear from the wording of the method claim.

The method claim does not express any link between the length of the Fresnel zone and the dimensions of an aperture which selects a portion of the zone. Evidently, if an aperture is to be used to select a portion of the Fresnel zone, then the Fresnel zone must be of such size as to permit the aperture to be inserted into the near-field region. However, it is not clear whether the size of the Fresnel zone may be considered to be "*substantial*" if it is just big enough to allow insertion of a practical aperture or whether a larger dimension is implied. Thus, although the method claim must be understood as implying that the diameter of the aperture is such as to produce a Fresnel zone at least large enough to permit a further aperture to be inserted in the near-field region, it is not clear if this is what is meant by "*substantial*".

2.3.2 In the witness statement, Mr Trevor Whittley explained that, in his understanding, "*substantial*" here means a significant near field zone of a size suitable for setting a practical aperture which will provide the stated condition that the near field zone contains many small light and dark volumes and that the overall volume be of useful size for an industrially relevant process" (section 9 of the witness statement).

It would appear that the aperture referred to by Mr Whittley is the aperture giving rise to the Fresnel

diffraction and not the aperture used for selecting a portion of the Fresnel (near-field) zone. This definition therefore appears to say no more than the diameter of the diffracting aperture must be of a practical size and be large enough to produce a near-field zone which is useful for an industrially relevant process.

The Board notes that this explanation also suffers from a lack of clarity with regard to the length of the near-field zone: it is not clear what (minimum) length is required for "*an industrially relevant process*".

2.3.3 The appellant submitted that the present invention could not be defined more precisely without unduly restricting the scope of the claims. With reference to the ashtray example in the Guidelines (C-III, 4.10 (version April 2010)), it was explained that the various parameters of the invention - the laser wavelength, beam diameter and aperture - might vary considerably while still providing the desired effect of a node pattern which provides a high degree of energy coupling to the target molecules.

The Board accepts that because of the interdependency of the beam diameter, the beat frequency and the desired length of the Fresnel zone, the beam diameter cannot be defined in absolute terms. However, the criterion which dictates what the diameter of the beam should be is not clear, the step of setting the beam diameter being defined in terms of the indeterminate "*substantial Fresnel zone*" to which it gives rise. No attempt has been made in the wording of claim 10 to

quantify "*substantial*" by explaining - even in terms of a result to be achieved - how long this zone should be.

- 2.3.4 The appellant also argued that the assessment of the clarity of a claim had to be an assessment of whether the claim defines the invention with sufficient clarity that a person skilled in the art could determine the boundaries of the claimed invention with a reasonable degree of certainty. The question was whether the claim, read as a whole, enabled a reasonable determination to be made as to whether a particular apparatus or method falls within the scope of the claim. The appellant held that, "*given the nature of the present invention ... one or more of the claims of the main and auxiliary requests currently pending in the proceedings meets this essential requirement.*"

The Board does not agree with this conclusion. In view of the indeterminate nature of the "*substantial Fresnel zone*", the Board is of the opinion that it is not possible for a skilled person to establish the boundary of the claimed invention. It is not clear which beam diameters would fall under the scope of the claim because it is not clear when a "*substantial Fresnel zone*" is present.

- 2.4 *Meaning of "substantial majority of the destructive nodes"*

Claim 10 also contains the method step of "*selecting, by means of an aperture, a portion of the Fresnel zone in which a substantial majority of the destructive nodes is apparent relative to the constructive nodes.*"

Similar arguments to those presented above apply to the selection of a portion of the Fresnel zone containing a "*substantial majority*" of destructive nodes. Since it is not clear just how much of a majority of destructive nodes relative to constructive nodes must be apparent, the condition for selecting a portion of the Fresnel zone is also defined in indeterminate terms.

The appellant argued that the term "*substantial majority*" is concerned with the relative numbers of constructive and destructive nodes. It was submitted that the term "*substantial majority*" clearly meant significantly more than half. Given a Fresnel zone of suitable size, it would be apparent which part or parts contained the required "*substantial majority*" of destructive nodes.

The Board does not doubt that the skilled person would be able to establish whether a part of the Fresnel zone contains a "*majority*" of destructive nodes, but in view of the lack of clear definition of the term "*substantial majority*" - in particular the lower limit of "*substantial*" - the Board is of the opinion that the skilled person would not know when a "*substantial*" majority of destructive nodes is present. For example, it is unclear whether or not 55% would qualify as a substantial majority. The step of selecting a portion of the Fresnel zone is therefore not clearly defined because the criterion for making the selection is not clear.

2.5 For these reasons, the main request is not allowable.

3. Auxiliary requests

The finding of lack of clarity (Article 84 EPC 1973) also applies to independent claim 10 of each of the first and second auxiliary requests for the same reasons as given above with regard to the main request.

Therefore, the auxiliary requests are not allowable.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

R. Schumacher

G. Assi