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D E C I S I O N
of 15 April 2003

Case Number: T 0107/00 - 3.3.1

Application Number: 95907425.3

Publication Number: 0739339

IPC: C07D 305/14

Language of the proceedings: EN

Title of invention:

Chemical switching of taxo-diterpenoids between low solubility active forms and high solubility inactive forms

Applicant:

THE SCRIPPS RESEARCH INSTITUTE

Opponent:

-

Headword:

Taxo-diterpenoids/SCRIPPS RESEARCH

Relevant legal provisions:

EPC Art. 84, 113(2)
EPC R. 71(2)

Keyword:

"Main, first and second auxiliary request - clarity (no)
- indefinite structural feature not rendered clear by
functional features expressing the result to be achieved"
"Non-formalized request(s) - not admitted into proceedings"

Decisions cited:

T 0068/85, T 1129/97

Catchword:

-



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Boards of Appeal

Chambres de recours

Case Number: T 0107/00 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 15 April 2003

Appellant:

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Representative:

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Decision under appeal:

Decision of the Examining Division of the
European Patent Office posted 4 August 1999
refusing European patent application
No. 95 907 425.3 pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: A. J. Nuss
Members: P. F. Ranguis
R. T. Menapace

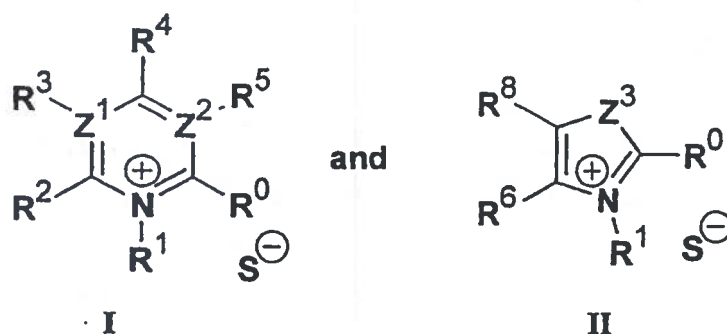
Summary of Facts and Submissions

- I. This Appeal lies from the Examining Division's decision to refuse the European application No. 95 907 425.3 (publication No. 0 739 339) pursuant to Article 97(1) EPC on the ground that Claim 1 of the then pending request (Claims 1 to 8 received on 7 January 1999) did not meet the requirements of Article 84 EPC as it lacked clarity.
- II. In the reasons for the decision, the Examining Division held that the taxo-diterpenoids of Claim 1 were not defined in terms of structure but in terms of a technical result to be achieved (i.e. taxo-diterpenoids which can be solubilised using the process of Claim 1). Such a functional definition was neither justified on the ground that the claimed invention could only be defined in such terms, nor on the ground that the structural definition given in Claim 2 would have unduly restricted the scope of the claims.
- III. With the statement of grounds of appeal, the Appellant contested the Examining Division's decision. In response to a communication of the Board maintaining the objection under Article 84 EPC, the Appellant abandoned the refused request and filed in lieu thereof two sets of claims as main request and first auxiliary request.

The main request comprised eight claims, Claim 1 reading as follows:

"1. A method of increasing the solubility of a taxo-diterpenoid in an aqueous solvent, the taxo-diterpenoid including a hydroxyl group in a Cⁿ position, the method

comprising the step of derivatizing the Cⁿ-hydroxyl by means of a substitution reaction with a 2-halogenated aza-arene onium salt for producing a taxo-diterpenoid-Cⁿ, 2-O-aza-arene onium salt having a higher solubility than said taxo-diterpenoid, the 2-halogenated aza-arene onium salt being selected from a group of onium salts represented by the following structures I and II:



wherein:

R⁰ is a halogen selected from the group consisting of Cl, Br, F, and I;

Z¹ and Z² are each selected from the group consisting of C and N;

Z³ is selected from the group consisting of S and O;

R¹ is selected from the group consisting of C₁-C₆alkyl, allyl, arenxyl, propargyl, and fused aryl;

R² and R⁶ are independently selected from the group consisting of H, C₁-C₆alkyl, allyl, arenxyl, propargyl, and fused aryl;

S is a counter ion;

if Z¹ is C, then R³ is selected from the group consisting of H, C₁-C₆alkyl, allyl, arenxyl, propargyl, C₁-C₆O-alkyl, OH, halogen and fused aryl;

if Z¹ is N, then R³ is absent;

R⁴ and R⁸ are each selected from the group consisting of

H, C₁-C₆alkyl, allyl, arenxyl, propargyl, C₁-C₆O-alkyl, OH, halogen and fused aryl; and
if Z² is C, then R⁵ is selected from the group consisting of H, C₁-C₆alkyl, allyl, arenxyl, propargyl, C₁-C₆O-alkyl, OH, halogen and fused aryl; and
if Z² is N, then R⁵ is absent
wherein said higher solubility form of the taxo-diterpenoid produced is capable of being converted back to the lower solubility form by contacting the higher solubility form with a serum protein for converting the Cⁿ-substitution from the taxo-diterpenoid-Cⁿ,2-aza-arene onium salt to a serum protein:taxo-diterpenoid intermediate, which can spontaneously dissociate to produce the original lower solubility form of taxo-diterpenoid".

The first auxiliary request was identical to the main request, except that Claim 6 of the main request was deleted (Claim 1 of the first auxiliary request remaining, therefore, identical to Claim 1 of the main request).

- IV. In a second communication accompanying the summons to oral proceedings, the Board objected, in addition to the objections raised in the first communication, to the expression "taxo-diterpenoid" in Claim 1 of the main and first auxiliary request. The Appellant thus requested as second auxiliary request that the expression "taxo-diterpenoid" be amended to "taxoid". He further submitted that the expression "taxoid-type diterpenoid" could be used if the Board preferred.
- V. Oral proceedings took place on 15 April 2003. The Appellant informed the Board that he would not be represented at these oral proceedings and requested

that a decision be taken on the basis of its written submissions. These Oral proceedings thus took place in the absence of the Appellant (Rule 71(2) EPC).

VI. In support of the clarity of Claim 1 of each request, the Appellant submitted the following arguments:

The expression "taxo-diterpenoid" was well understood by the person skilled in the art, as evidenced by the following literature:

- (1) Webster's Third New International Dictionary ("diterpenoid", "diterpenoid")
- (2) Progress in the Chemistry of Organic Natural Products, DGI Kingston, et al, vol. 61 (1993), page 8,
- (3) www.biotech.icmb.utexas.edu/botany/chemtab ("docetaxel", "paclitaxel")

It was not denied that the subject-matter of Claim 1 was defined partly using functional language, i.e. by reference to the result to be achieved. However, the claimed invention lay in the discovery of the switching between high and low solubility forms of taxo-diterpenoids. Limitation of the taxo-diterpenoid compounds to the specific compounds defined in Claim 2 would allow a third party to get round the scope of the invention by making a minor modification to the defined compounds of Claim 2 and would deprive the Applicant of the just reward for the disclosure of the present invention. It was hard to predict all forms of taxo-

diterpenoids which would give rise to the process steps defined in Claim 1 and so a requirement to specify the precise taxo-diterpenoid would unduly restrict the scope of the claims.

In the present case, the features defined in functional terms provided instructions which were sufficiently clear for a skilled person to reduce the invention to practice without undue burden, if necessary with reasonable experiments (cf. pages 9 and 10 of the application as filed). Therefore, the definition of Claim 1 by a functional feature was in line with the case law of the Board of Appeal, in particular T 68/85 (cf. OJ EPO 1987, 228).

The scope of protection of Claim 1 in terms of a taxo-diterpenoid that was capable of being solubilised and desolubilised using the chemical switching method described was commensurate with the technical contribution that the present invention made to the art.

- VII. The Appellant requested that the decision under appeal be overturned and the case be remitted to the first instance with the order to grant a patent on the basis of the main request or the first auxiliary request filed with letter received on 25 October 2002. In a further letter received on 14 March 2003, the Appellant requested that the expression "taxo-diterpenoid" in the claims of the main and the first auxiliary request be amended to "taxoid" (second auxiliary request) or "if the Board of Appeal prefers", that the alternative terms "taxo-diterpenoid" or "taxoid-type diterpenoid" be used.

VIII. At the end of the oral proceedings the decision of the Board was announced.

Reasons for the Decision

1. The appeal is admissible.

2. *Procedural matters*

Claim 1 of the main request and the first auxiliary request have the same wording (cf. point III above). In view of the outcome of the present decision, it is appropriate to deal with both requests jointly.

Main request and first auxiliary request

3. *Article 84 EPC*

3.1 Present Claim 1 relates to a method of increasing the solubility of a taxo-diterpenoid in an aqueous solvent and comprises several features, namely:

a starting product: "the taxo-diterpenoid including a hydroxyl group in a Cⁿ position",

a step for producing a higher soluble form of the taxo-diterpenoid

and another feature expressing the capability of the higher soluble form to be switched back to the lower soluble form (cf. point III above).

The general definition given for the lower soluble form of taxo-diterpenoids is, in the Appellant's view, clearly identified by the features related to the transformation of the lower soluble form into the higher soluble form and the switching back of the higher soluble form into the lower soluble form.

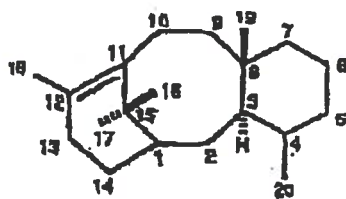
The Board concurs with the Appellant that the transformation steps can be viewed as functional features and it must be examined, in the present case, whether the combination of the feature related to the defined taxo-diterpenoid structure and the functional features mentioned above render the claim clear, it being understood that the claim must be **clear per se** without the need to refer to the description (cf T 1129/97, OJ EPO 2001, point 2.1.2 of the reasons).

3.2 The first question to be answered is whether the skilled reader understands in the light of the common general knowledge what sort of products underlies the definition of the starting taxo-diterpenoids of Claim 1.

3.3 The Appellant provided as evidence of common general knowledge, *inter alia* document

(2) Progress in the Chemistry of Organic Natural Products, DGI Kingston, et al, vol. 61 (1993), page 8.

According to this document, the taxane diterpenoids can all be considered as compounds having the taxane skeleton (1.1) or a closely related skeleton.



1.1

Although it is true that the mere breadth of a term of art as such does not justify a clarity objection if the meaning of such term is unambiguous for the skilled reader, the situation here is that this definition of a skeleton, i.e. a basic structure or a not specified closely related structure, in combination with the feature "including a hydroxyl group in a C" position" covers a countless number of indefinite compounds having one or more hydroxyl groups attached to any theoretically possible position of the skeleton, said skeleton being, moreover, possibly substituted by any group since, for instance, taxol comprises at position 13 a substituent β -(benzoylamino)- α -hydroxybenzene-propanoyloxy and taxotere a substituent β -[[(1,1-dimethylethoxy) carbonyl]-amino]- α -hydroxybenzene-propanoyloxy.

In view of the indefinite structural definition set out in Claim 1, the skilled reader has no idea either of the number and position of the hydroxyl groups, or of the nature of the substituents, their position and their number. Such a definition does not, therefore, clearly identify the starting compounds encompassed by the claimed method.

Documents (1) and (3) provide no further relevant information in that respect.

3.4 According to the Appellant's submissions, what matters is that Claim 1 is clear by the functional features expressing the result to be achieved (cf. point 3.1 above).

Under these circumstances, the question to be answered is whether those functional features, here the transformation steps indicated in Claim 1 (cf. point III above), effectively remove the fundamental unclarity of a structural feature, namely a structural feature for which the skilled reader cannot find a clear definition with the help of his common general knowledge.

3.5 The Appellant cited, in that respect, extensive case law concerning cases where the facts differed from the present case. In particular, reference was made to the decision T 68/85 (cf. OJ EPO 1987, 228). He should however have explained why this decision is relevant for the present case. The Board observes that decision T 68/85 related to (a) a functional feature (synergistic effect) which relied on (b) a **clear** structural feature, i.e. an association of two well known herbicides (points 10.1 and 10.2 of the reasons), said functional feature (a) restricting a large but nevertheless well-defined composition (b). Element (b) is precisely the fundamental difference between the case T 68/85 and the present one. Indeed, the structural definition of the taxo-diterpenoid compounds is unclear for the skilled reader (cf. point 3.3 above) and for this reason, the cited jurisprudence is not relevant for the present case.

3.6 It is certainly permissible to define technical features in a claim in functional terms if, from an objective point of view, such features cannot otherwise be defined more precisely without unduly restricting the scope of the invention, and if these features provide instructions which are sufficiently clear to the skilled person to reduce them to practice without undue burden, if necessary with a reasonable number of experiments.

However, in the present case, even with the assistance of the description which discloses on pages 9 and 10 a method for transforming taxol-2'-methylpyridinium tosylate to taxol, it would still be necessary to identify among the host of undefined starting compounds those which can be transformed by this method, requiring the application of that method to a great number of compounds in the absence of any guidance. This would require an equally unquantifiable and thus unreasonable amount of experimentation, resulting in an undue burden going beyond what can be expected from a skilled reader.

It follows from the above, that functional features defining the result to be achieved in connection with an indefinite structural feature, as is the case here, cannot assist in rendering a claim clear, since it still leaves open what exactly the subject-matter is for which patent protection is now claimed. Such a claim would impose a severe and undue burden on all those wishing to ascertain the scope of the exclusive right (e.g. the public and the third parties), which would be contrary to Article 84 EPC which requires that "the claims shall define the matter for which protection is sought".

3.7 The Appellant also argued that a restriction of the application to the subject-matter of Claim 2 would allow a third party to get round the invention easily and would deprive the Appellant of a just reward for the disclosure of the invention. However, such a criterion is not a pertinent one for establishing clarity under the EPC which is, irrespective of the scope of protection conferred by a certain wording of the claims, a prerequisite of its own for granting a patent.

3.8 Nor can the Board take into consideration the contribution to the art when assessing the compliance of a claimed subject-matter with the clarity requirement since it is a logical prerequisite for the assessment of such contribution, that the claimed subject-matter be clear.

3.9 Since Claim 1 of the main request and the first auxiliary request do not comply with the requirements of Article 84 EPC, these requests are not allowable.

Second auxiliary request

4. *Article 84 EPC*

4.1 The Appellant requested that the expression "taxo-diterpenoid" be replaced by "taxoid" in the claims of the main and the first auxiliary request.

4.2 According to document (2) the term "taxoid" is an abbreviation to describe the taxane diterpenoids.

4.3 The Board concurs with the Appellant that both expressions are tantamount to each other. However, the term "taxoid" does not specify further the undefined structure of the starting "lower soluble taxo-diterpenoid including a hydroxyl group in a Cⁿ position". It follows that the conclusions reached about the subject-matter of the main request apply *mutatis mutandi* to the subject-matter of the second auxiliary request (cf. point 3 above). The second auxiliary request cannot, therefore, be allowed either.

5. *Article 113(2) EPC*

5.1 The Appellant declared that "if the Board of Appeal preferred" the alternative terms "taxo-diterpenoid" or "taxoid-type diterpenoid" could be used in the claims of the main and first auxiliary request.

5.2 Article 113(2) EPC states that the European Patent Office shall consider and decide upon the European patent application only in the text submitted to it, or agreed, by the applicant.

5.3 The declaration of the Appellant (cf. point 5.1 above), leaving the choice to the Board to decide which text to be examined, is not in conformity with the requirements of Article 113(2) EPC and must be disregarded.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

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N. Maslin

The Chairman:

A handwritten signature in black ink, appearing to be 'A. Nüss', with a large, sweeping initial 'S' and a long horizontal stroke extending to the right.

A. Nüss

