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D E C I S I O N
of 30 January 1996

Case Number: T 0337/95 - 3.3.1

Application Number: 90103338.1

Publication Number: 0443059

IPC: C07D 231/18

Language of the proceedings: EN

Title of invention:

3-(Substituted phenyl)pyrazole derivatives, salts thereof, herbicides therefrom, and process for producing said derivatives or salts

Applicant:

NIHON NOHYAKU CO., LTD.

Opponent:

-

Headword:

Lower alkyl/NIHON NOHYAKU

Relevant legal provisions:

EPC Art. 84

EPC R. 29(1), 35(12)

Keyword:

"Clarity of claims for compounds per se"

"Meaning of 'lower alkyl' unclear"

Decisions cited:

G 0002/88 and J 0034/92 (followed), T 0860/93 (distinguished)

Headnote:

1. Claims have to be clear for the sake of legal certainty (Nos. 2.2 to 2.4 of the Reasons).
2. Since, in the absence of any unambiguous reference point, a relative term such as "lower alkyl" in the field of organic chemistry does not have a generally accepted meaning with respect to its maximum number of carbon atoms, such a term is ambiguous and therefore not suitable for clearly defining the subject-matter for which protection is sought in a claim which is directed to a group of organic compounds per se (No. 2.8 of the Reasons).

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Headnote follows :



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Chambres de recours

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Case Number: T 0337/95 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 30 January 1996

Appellant:

NIHON NOHYAKU CO., LTD.
1-2-5, Nihonbashi
Chuo-ku
Tokyo (JP)

Representative:

Grünecker, Kinkeldey,
Stockmair & Schwanhäusser
Anwaltssozietät
Maximilianstrasse 58
D-80538 München (DE)

Decision under appeal:

Decision of the Examining Division of the European
Patent Office posted 21 October 1994 refusing
European patent application No. 90 103 338.1
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: A. J. Nuss
Members: P. Krasa
R. E. Teschemacher

Summary of Facts and Submissions

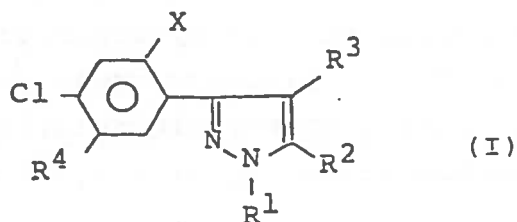
I. The Appellant lodged an appeal against the decision of the Examining Division refusing application No. 90 103 338.1.

The Examining Division had held that the application did not meet the requirements of Article 84 EPC, since the term "lower" used in the definitions of substituents in the generic structural formulae of the first set of claims, submitted as the main request on 22 April 1994, rendered these claims unclear. It had held further that the content of the claims according to an auxiliary request of the same date was not allowable either under Article 123(2) EPC.

II. The Appellant requested that the decision under appeal be set aside and a patent be granted either on the basis of the first set of claims received on 22 April 1994 (main request), or alternatively on the basis of Claims 1 to 7 submitted during oral proceedings held, at the Appellant's request, on 30 January 1996 (first auxiliary request), or alternatively on the basis of the second or third set of claims received on 28 February 1995 (second and third auxiliary requests).

III. The following passages from Claim 1 according to the main request are sufficient as a basis for the present decision:

"1. A 3-(substituted phenyl)pyrazole derivative ... being represented by the general formula

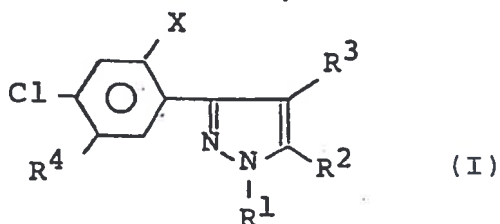


wherein

- X,
- R¹ denotes lower alkyl or lower haloalkyl,
- R²,
- R³, and
- R⁴"

Claim 1 according to the first auxiliary request reads as follows:

"1. A 3-(substituted phenyl)pyrazole derivative or a salt thereof, the derivative being represented by the general formula



wherein

- X denotes halogen,
- R¹ denotes CH₃,
- R² denotes hydroxy, mercapto, alkylthio, haloalkoxy or haloalkylthio,
- R³ denotes hydrogen or halogen, and
- R⁴ denotes (i) formyl, (ii) nitro, (iii) -CO-B-R⁶ wherein B denotes -O-, -S-, or -NR⁷, R⁶ and R⁷ are the same or different and each denote hydrogen or cycloalkyl, and when B is -O-, R⁶ can be an alkali metal atom or a quaternary ammonium salt, or -CO-B-R⁶ denotes methoxy-, ethoxy-, propoxy- or butoxycarbonyl-, methoxycarbonylmethoxy-, ethoxycarbonylmethoxy-, propoxycarbonylmethoxy-, methoxycarbonylethoxy-, ethoxycarbonylethoxy-, or propoxycarbonylethoxycarbonyl, (iv) -D-R⁸ wherein D

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denotes -O-, S(O)_n, n being an integer of 0 to 2, or -NR⁹-, R⁸ and R⁹, which are the same or different, each denotes hydrogen; alkyl; haloalkyl; aminosulfonyl; phenylalkyl or phenoxy-alkyl optionally having on the phenyl ring one or more halogen substituents which are the same or different; or -D-R⁸ denotes an alkenyloxy group containing propenyl, butenyl or pentenyl; an alkynyloxy group containing propynyl, butynyl or pentynyl; an alkenylamino group containing propenyl, butenyl or pentenyl; an alkoxy-carbonyl-alkoxy or an alkylthiocarbonylalkoxy group containing each methyl, ethyl, propyl or butyl; or (v) -(CHR¹⁰)_m-CO-E-R¹² wherein E denotes -O-, -S-, or -NR¹¹; R¹⁰ denotes hydrogen and R¹¹ and R¹², which are the same or different, each denotes hydrogen; alkyl; haloalkyl; phenyl optionally having on the phenyl ring one or more halogen substituents; phenylalkyl optionally having on the phenyl ring one or more halogen substituents; or R¹¹, jointly with R¹², forms a piperidino or morpholinyl group, and when E is -O-, R¹² can be an alkali metal atom or a quaternary ammonium salt; and m denotes an integer of 0 to 3."

IV. The Appellant argued in writing and orally essentially as follows:

Firstly, the Examining Division had erred when stating that the term "lower" is unclear since it is commonly used by skilled persons and, furthermore, is clearly defined having regard to

- (1) Robert T. Morrison/Robert N. Boyd, Lehrbuch der Organischen Chemie, 2., berichtigte Auflage, Verlag Chemie, Weinheim - New York (1978), 91,

and

- (2) Hans Breuer, dtv-Atlas zur Chemie, Band 2, Organische Chemie und Kunststoffe, Deutscher Taschenbuch Verlag, München (1983), 319.

Secondly, according to decision T 860/93, the claims should have been interpreted by reference to the specification and, in particular, pages 4 and 5 as originally filed, which would render the term "lower alkyl" clear.

- V. In the annex to the summons, the Board noted that the Appellant had not shown the existence of an explicit definition of terms like "lower alkyl" in the relevant technical field, ie organic chemistry, let alone its general acceptance by those skilled in that field.

Further, the Board pointed out that, on the one hand, the Appellant's inference from the two citations (1) and (2) that an unambiguous implicit definition of "lower alkyl" existed, seemed not to be conclusive and that, on the other hand, an inspection of several other textbooks on organic chemistry by the Board had indicated that the term "lower alkyl" is used in the art with several different meanings. For the purpose of this decision, the Board will only rely on

- (3) A. Streitwieser, Jr., C.H. Heathcock, "Organische Chemie", Weinheim-Deerfield Beach, Florida-Basel: Verlag Chemie, 1980, 257,

and

- (4) Carl R. Noller, "Lehrbuch der Organischen Chemie", Berlin-Göttingen-Heidelberg: Springer-Verlag, 1960, 100.

VI. At the end of the oral proceedings, the Chairman announced the Board's decision to allow the first auxiliary request.

Reasons for the Decision

1. The appeal is admissible.

2. *Main request*

2.1 The sole issue to be decided in this context is whether or not the claims of this request and, in particular, Claim 1 comply with the requirements of Article 84 EPC which are as follows:

"The claims shall define the matter for which protection is sought. They shall be clear and concise and be supported by the description" (emphasis added).

Rule 29 EPC elaborates on Article 84. The first sentence of Rule 29(1) EPC reads as follows:

"The claims shall define the matter for which protection is sought in terms of the technical features of the invention" (emphasis added).

2.2 The central role of the claims in the European patent system was pointed out by the Enlarged Board of Appeal when it held that the purpose of the claims is to allow the determination of the protection conferred by the patent (G 2/88, OJ EPO 1990, 93; Corr. OJ EPO 1990, 469, Nos. 2.4 and 2.5 of the Reasons for the Decision).

2.3 Further, the Enlarged Board of Appeal confirmed that the primary aim of the wording used in a claim must be to satisfy the requirement of defining the subject-matter for which protection is sought in terms of the technical features of the invention (having regard also to Rule 29(1) EPC; G 2/88, loc. cit., No. 2.5 of the Reasons for the Decision).

2.4 This approach ensures that the public is not left in any doubt as to which subject-matter is covered by a particular patent and which is not. This is one aspect of legal certainty which is a principle of paramount importance in any system where the rights of the public are affected by the granting of a monopoly (see J 34/92, not published in the OJ EPO, No. 4.1 of the Reasons for the Decision).

2.5 In the Board's judgement, this principle of legal certainty is also reflected in the requirement laid down in the second sentence of Article 84 EPC, ie that the claims have to be clear. Rule 35(12), last sentence, serves the same purpose since it requires, for the presentation of the application documents, and therefore also of the claims, that

"In general, use should be made of the technical terms, signs and symbols generally accepted in the field in question" (emphasis added).

2.6 In the present case, organic compounds *per se* are the subject-matter for which protection is sought in Claim 1. These compounds are defined as members of a group of chemical compounds represented by the generic structural formula (I) (see No. III above). To comply with the clarity requirement of Article 84 EPC, this group of chemical compounds has to be defined in a manner enabling the notional skilled person to

distinguish unambiguously the chemical compounds belonging to the claimed group from those not encompassed by it.

2.7 In Claim 1, the only technical features which define the matter for which protection is sought are the structural features of the compounds concerned. Thus, it has to be investigated whether or not the technical terms denoting these structural features, ie the structural elements or substructures of the group of chemical compounds represented by the generic structural formula (I), are generally accepted in the field in question. This investigation can be confined to the term "lower alkyl". As already stated, the subject-matter of Claim 1 is a group of organic compounds. The relevant technical field is therefore that of organic chemistry. This was confirmed by the Appellant's filing of documents (1) and (2), both relating to this field.

2.7.1 The Appellant has not shown the existence of, nor is the Board aware of, any explicit definition of the term "lower alkyl" as such, let alone its general acceptance by those skilled in the technical field in question.

2.7.2 However, the Appellant inferred from document (1) - obviously from the first paragraph after the heading on page 91 - that the **higher** alkanes are those from hexane upwards and evidently concluded that the term "lower alkyl" is therefore implicitly defined in document (1) as an alkyl residue with up to five carbon atoms. When translated into English, the relevant passage reads as follows:

"For the alkanes with one, two, three, four, and five carbon atoms ... the names methane, ethane, propane, butane and pentane are used. In table 3.2 the names of higher alkanes are listed."

2.7.3 Although the Board can accept the Appellant's interpretation of document (1), it cannot accept that document (2) should be regarded as corroborating evidence for the above definition of "lower alkyl". The relevant passage in this citation reads, when translated into English, as follows:

"The first members of the homologue series of the alkanes have trivial names: methane CH_4 , ethane C_2H_6 , propane C_3H_8 , butane C_4H_{10} . The names of the higher alkanes commence with a Latin or Greek numeral and end with -ane.

Examples: " (emphasis added). The four examples which are listed name n-hexane, n-decane, n-heptadecane and n-eicosane together with the formulae of these compounds (page 319, left hand column, lines 32 to 45).

It should be noted that pentane, which is not mentioned in the above-quoted passage, is the first alkane with a name consisting of a numeral as defined above and the ending -ane. Thus, **pentane meets the definition of the higher alkanes** as provided in document (2). This implies that, according to document (2) and contrary to the Appellant's submission, "lower alkyl" corresponds to an alkyl residue with no more than four carbon atoms. This is not contradicted by the fact that the small list of exemplified "higher alkanes" starts with hexane (not pentane), since this is obviously only a rudimentary list composed of several arbitrarily chosen higher alkanes.

2.7.4 Thus, in both documents (1) and (2) the term "lower", when referring to alkyl groups, gains a definite meaning only in a particular context, ie in relation to a specific carbon atom number; no general definition is given for this term. As explained above, the term "lower

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alkyl" can be understood according to document (1) as "all alkyl groups with fewer than six carbon atoms", and according to document (2) as "all alkyl groups with fewer than five carbon atoms". This discrepancy between documents (1) and (2) is sufficient to rebut the Appellant's allegation that "lower alkyl" has a meaning which is **generally** accepted in the technical field in question (Rule 35(12), last sentence, EPC).

2.7.5 Moreover, an inspection of other textbooks on organic chemistry reveals that the term "lower alkyl" is used in the art with even more meanings. In document (3), some physical properties of "lower" alcohols including n-hexylalcohol are listed in table 11-2. According to this textbook, "lower alkyl" would also encompass hexyl. On the other hand, n-butylalcohol is discussed in document (4) under the heading "Higher Alcohols", suggesting that "lower alkyl" ends with propyl.

2.8 The above considerations show that the term "lower alkyl" on its own, ie in the absence of any unambiguous reference point, does not have a "well-recognised meaning" in the art of organic chemistry. This would have been needed for the use of such a relative term in Claim 1 to be legitimate (see Guidelines for Examination in the EPO, C-III, 4.5). According to the available evidence, there exists no meaning of "lower alkyl" generally accepted by those skilled in the art. In particular, it is unclear what the upper limit of the carbon atom number is for a (saturated) hydrocarbon radical to be a "lower alkyl". This term is therefore not suitable for clearly defining the subject-matter for which protection is sought in Claim 1 which is directed to a group of organic compounds per se.

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2.9 Nor can the Board accept the Appellant's second line of argument based on decision T 860/93 (OJ EPO 1995, 47), ie that the term "lower alkyl" would be clear to a skilled person in the light of the specification and, in particular, the original disclosure on pages 4 and 5 as filed.

2.9.1 On these pages, (preferred) examples are disclosed for the various substituents of the compounds of formula (I). As far as lower alkyls are concerned, it is stated that "... preferred are lower alkyls **including** methyl" and "... a lower alkyl group **such as** methyl, ethyl, propyl, or butyl" (page 4, lines 14 and 15, and page 5, lines 17 and 18; emphasis added). Thus, in both instances the skilled person cannot find a definition of the term "lower alkyl" but merely a non-limiting exemplification.

2.9.2 Even if the Board were to accept - for the sake of argument and for the Appellant's benefit - that the information relating to lower alkoxy-, lower alkenyl-, or lower alkynyl groups given on page 5, lines 5 to 15, of the application as filed sheds light on the intended meaning of "lower alkyl", this would not help the Appellant. All the meanings disclosed on page 5 are only given as preferred examples and are in no way limiting. Moreover, these examples are not even consistent with respect to the upper limit of the possible carbon atom number. For lower alkoxy, the highest members given are either butoxy (for lower alkoxy-carbonyl; page 5, lines 5 and 7) or propoxy (for lower alkoxy-carbonyl-alkoxy-carbonyl; page 5, lines 5, 8, and 9); the highest members disclosed for alkenyl and alkynyl are pentenyl and pentynyl, respectively (page 5, lines 13 and 14). In the present case, the specification does not therefore

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provide any conclusive evidence for a definite upper limit on the number of carbon atoms which a "lower alkyl" group may contain.

2.9.3 In view of the above, it is not necessary in the present case to decide whether or not it would have been sufficient (in order to meet the requirements of Article 84 EPC) that a skilled reader could resolve any lack of clarity in Claim 1 by referring to the description (cf Guidelines for the Examination in the EPO, C-III, 4.2).

2.10 As for decision T 860/93 referred to by the Appellant, the Board does not find that decision pertinent, since in that case the term "water-soluble" was held to be sufficiently precise to make the claim clear in the light of the available evidence (T 860/93 loc. cit., Nos. 4.1, 4.2 and 4.5). In the present case, however, the available evidence shows the contrary, namely that the term "lower alkyl" is not precise but vague (see above No. 2.8).

2.11 For the above reasons, the Board concludes that Claim 1 of the main request does not comply with the clarity requirement of Article 84 EPC.

3. *First auxiliary request*

3.1 Amended Claim 1 is duly supported by the application documents as filed: the meaning of X and R³ is disclosed in original Claim 1; the meaning of R¹ and R² is disclosed on original page 4, line 15, and lines 16 to 18 of the specification, respectively; and the definition of R⁴ is disclosed in original Claim 1, in combination with the disclosure on page 5, lines 5 to 9, and lines 12 to 18. Claim 2 is in fact a collection of originally disclosed examples. Claim 3 is supported by

original Claim 6, in combination with original Claim 1 and page 5, lines 12 to 18, of the specification as filed. Claim 4 is supported by original Claim 7, in combination with original Claim 1 and the disclosure on page 5, lines 5 to 9 of the specification as filed. Claims 5, 6, and 7 are based on original Claims 8, 13, and 18, respectively. Thus, there can be no objection to Claims 1 to 7 under Article 123(2) EPC.

- 3.2 The claims of the first auxiliary request no longer contain any of the terms objected to such as "lower alkyl". Therefore the ground for refusal of the application has been removed.

4. It follows from point 3.2 above that the decision of the Examining Division has to be set aside. However, the application and the invention to which it relates have still to be examined to establish whether or not they comply with all the other requirements of the EPC. The case is therefore remitted under Article 111(1) EPC to the Examining Division for further prosecution. This will also provide an opportunity to check whether or not the term "ammonium salt" in the definitions of R⁶ and R¹² (eg in Claim 1) is appropriate.

In these circumstances, it is not necessary to consider the Appellant's second and third auxiliary requests.

Order

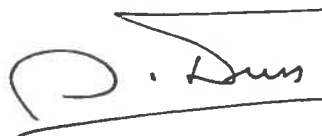
For these reasons it is decided that:

1. The decision of the Examining Division is set aside.
2. The case is remitted to the Examining Division for further prosecution on the basis of Claims 1 to 7 submitted during oral proceedings.

The Registrar:


E. Gorgmaier

The Chairman:


A. Nuss



