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**D E C I S I O N**  
of 25 October 2000

**Case Number:** T 0362/97 - 3.3.2

**Application Number:** 88870068.9

**Publication Number:** 0290416

**IPC:** A01N 25/30

**Language of the proceedings:** EN

**Title of invention:**  
Improved glyphosate formulations

**Patentee:**  
MONSANTO EUROPE S.A.

**Opponent:**  
ZENECA Limited

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**Headword:**  
Glyphosate formulations/MONSANTO

**Relevant legal provisions:**  
EPC Art. 56, 111(1)

**Keyword:**  
"Amended claims of the main request: acceptable under the terms of Article 123(2) and (3) EPC"  
"Inventive step (not decided): remittal to the department of first instance"

**Decisions cited:**  
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**Catchword:**  
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Case Number: T 0362/97 - 3.3.2

**D E C I S I O N**  
of the Technical Board of Appeal 3.1.1  
of 25 October 2000

**Appellant:**  
(Proprietor of the patent)

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**Respondent:**  
(Opponent)

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**Decision under appeal:**

Decision of the Opposition Division of the  
European Patent Office posted 31 January 1997  
revoking European patent No. 0 290 416 pursuant  
to Article 102(1) EPC.

**Composition of the Board:**

**Chairman:** R. E. Teschemacher  
**Members:** G. F. E. Rampold  
J. Riolo

## Summary of Facts and Submissions

- I. European patent No. 0 290 416 comprising 25 claims was granted to the appellant (proprietor) in response to European patent application No. 88 870 068.9. Claim 1 and dependent claims 2 to 18 were directed to herbicidal compositions essentially comprising an aqueous solution containing the components (a) a solubilised glyphosate, (b) a surfactant belonging to the class of alkoxyated fatty amines, and optionally (c) an inorganic ammonium salt. Claim 19 and dependent claims 20 to 25 related to a herbicidal method comprising spraying weeds with a solution of the herbicidal composition according to claim 1.
- II. The respondent (former opponent, see paragraph VI below) originally filed opposition against the grant of the patent and requested that it be revoked in its entirety pursuant to Article 100(a) and (b) EPC on the grounds of lack of inventive step (Article 52(1); 56 EPC) and insufficiency of disclosure (Article 83 EPC). The grounds for opposition were supported, *inter alia*, by the following citations:
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- (6) D. J. Turner, P. M. Tabbush, "Studies with alternative glyphosate formulations", published in BCPC Monogram, No. 28, Symposium on Application and Biology 1985, pages 135-145;
- (8) D. J. Turner, M. P. C. Loader, "Effect of ammonium sulphate and other additives upon the phytotoxicity of glyphosate to *Agropyron repens* (L.)", published in Weed Research, Vol. 20, 1980, pages 139-146;

- (9) D. J. Turner, "Effects on glyphosate performance of formulation, additives and mixing with other herbicides, published in The Herbicide Glyphosate, Butterworths 1985, Chapter 15, pages 221-240.

III. During the oral proceedings before the opposition division the appellant requested maintenance of the patent in amended form on the basis of claims 1 to 20 filed on 3 November 1994 (main request) or claims 1 to 16 filed on 11 October 1996 (auxiliary request). The claims of the auxiliary request differed from those as granted by the exclusion of inorganic ammonium salts as the component (c) of the claimed composition. The patent was revoked pursuant to Article 102(1) EPC by a decision of the opposition division posted on 31 January 1997.

IV. The stated ground for revocation was that neither the main nor the auxiliary request involved an inventive step over the state of the art according to citations (6), (8) and (9) and that claim 1 of the main request contravened Article 123(2) EPC. The essence of the ~~reasoning given in the decision of the opposition~~ division was as follows:

The opponent's submissions did not provide a basis for the opposition under Article 100(b) in conjunction with Article 83 EPC on the ground of insufficiency of disclosure.

As to inventive step, the opposition division considered that the use of surfactants of the formula given in claim 1 in the particular weight ratios of solubilised glyphosate to surfactant specified in claim 1 was obvious to a person skilled in the art, in the light of the teaching of citations (6), (8) and (9).

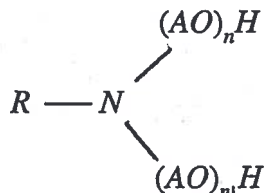
- V. The appellant lodged an appeal against this decision and filed together with the statement of the grounds of appeal as the sole request an amended set of 7 claims, all directed to a herbicidal method according to claim 19 of the patent as granted. The respondent filed his observations on the statement of appeal.
- VI. By a faxed letter dated 9 December 1999 the respondent withdrew its opposition.
- VII. In advance of the oral proceedings, scheduled to take place on 25 October 2000, the appellant filed a new main request comprising 6 claims with amended claim 1 relating to an aqueous solution essentially consisting of the components (a) and (b).

The claims 1 to 3 of the auxiliary request were directed to a herbicidal method comprising spraying weeds with a solution according to claim 1 of the main request.

- VIII. The board issued a communication informing the appellant of its preliminary opinion that the definition of the surfactant (b) in the amended claims of the main request was not clear and that the expression "consisting essentially of" in claim 1 of both requests could not be construed as excluding the presence of other components in addition to components (a) and (b) in the claimed compositions.

- IX. Following a discussion at the beginning of the oral proceedings concerning the scope of the claims according to the main request, the appellant filed an amended version of the main request with claim 1 reading as follows:

"An aqueous solution consisting essentially of  
 (a) solubilised glyphosate in an amount equivalent to at least 40 grams per litre of glyphosate acid,  
 (b) a surfactant which is a mixture of amines having the formula



where A represents an alkylene group, n and n' being integers such that in individual amines n + n' has a value from 0 to 15, but in the mixture the average of the sum n + n' is from 2 to 10, R represents a straight- or branched-chain alkyl or alkenyl group, having a single value or an average value, of from 10 to 20 carbon atoms

and wherein the weight ratio of the solubilised glyphosate (a) (expressed as glyphosate acid equivalent) to the surfactant (b) is from 1.5:1 to 3:1,

with the proviso that the solution contains no significant amount of inorganic ammonium salt and no additional secondary surfactants."

X. The appellant's submissions, both in the written procedure and at the oral proceedings, can be summarised as follows:

The claimed invention was essentially concerned with improved herbicidal glyphosate compositions. The compositions according to the patent in suit comprised glyphosate herbicide and a low ethoxylated alkylamine surfactant. While at the priority date highly

ethoxylated, hydrophilic alkylamine surfactants were considered as the optimum surfactants in herbicidal glyphosate formulations, as evidenced by the disclosure of citations (6) and (8), the appellant had found that - contrary to all expectations - more efficacious formulations could be developed by using low ethoxylated, non-hydrophilic alkylamine surfactants instead.

The improved herbicidal activity was, however, not only the result of an inventive selection of the specified type of non-hydrophilic surfactants but surprisingly was also due to the modified and in fact higher ratio of solubilised glyphosate (a) to surfactant (b) or, differently expressed, the reduced levels of surfactant compared with those used in the state of the art. By referring in the impugned decision to the experimental evidence shown in Table 9 of citation (8), the opposition division did not take into account that this evidence was based on Roundup<sup>R</sup> as the glyphosate component, which itself contained relatively major levels of hydrophilic nonionic surfactants.

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As acknowledged by the opposition division in point 2.2 of the decision under appeal, the comparative data given in the patent in suit provided evidence of the improved performance of the claimed compositions, when working at different rates, with different ratios and under different conditions within the scope of the claims. This improvement was also evidenced by the commercial success of the claimed compositions in the patent in suit.

- XI. The appellant requested that the decision under appeal be set aside and the case be remitted to the first instance for further prosecution on the basis of claims 1 to 6 submitted as the main request during the

oral proceedings. Alternatively, it was requested to maintain the patent on the basis of the auxiliary request filed on 17 July 2000.

### Reasons for the Decision

1. The appeal is admissible.
2. All references below concerning the basis for the amendments in the present version of claims 1 to 6 according to the main request are to the application as filed:
  - 2.1 The definition of the surfactant (b) present in the aqueous solution according to claim 1 has been limited to a mixture of amines, as referred to on page 3, lines 12 to 24 and in claim 1 under (i) and (ii), and has moreover been restricted to the group disclosed on page 8, lines 20 to 22 (see: "the number or average number in the group or groups R is from about 10 to about 20") and lines 24 to 25 respectively (see: "the average value of  $n + n'$  lies more especially in the range from about 10 to about 20").
  - 2.2 The weight ratio of glyphosate (a) to surfactant (b) has been narrowed to the range disclosed on page 5, line 32 and in claim 3.
  - 2.3 Moreover, by the exclusion of the presence of a significant amount of inorganic ammonium salt in the claimed aqueous solution, the claims have been restricted to the embodiment of the claimed invention described in the originally filed documents which does not contain agriculturally acceptable inorganic ammonium salts in addition to components (a) and (b), (see: page 4, lines 27 to 30: "the concentrates of the



invention may contain a significant amount of an agriculturally acceptable inorganic ammonium salt in addition to components (a) and (b). Concentrates containing no significant amount of such salt .....".)

2.4 Similarly, by excluding the presence of any additional secondary surfactants, the claims have further been restricted to the embodiment of the claimed invention described in the originally filed documents which does not contain a secondary surfactant in addition to surfactant (b), (see: page 10, lines 1 to 6: "The concentrates and solutions of the invention may contain optional additional components for instance <.....>, secondary surfactants"; see also Tables 1 to 4: none of the solutions 1 to 39 disclosed in the contested patent contains a secondary surfactant).

2.5 Dependent claims 2 to 6 and 14 and 15 are based on the original ones in the following order, with the correction of a grammatical error in claim 4:

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present claims: 2, 3, 4, 5, 6;

original claims: 5, 7, 8, 10, 12.

2.6 All claims are therefore acceptable as being based on the disclosure of the application as filed and complying in this formal respect with Article 123(2) EPC.

2.7 The amendments mentioned above narrow the scope of protection conferred in comparison with the claims as granted. Thus, no objection under Article 123(3) EPC arises against the present claims either.

3. Apart from the fact that an objection to lack of novelty was never invoked as a ground for opposition by the former opponent, the board is satisfied that the novelty of the subject-matter of the present claims of the main request is not prejudiced by any of the cited documents.

4. The opposition division considered in paragraph 2.1 of the reasons for the decision that the technical problem to be solved by the claimed invention was that of providing "commercial glyphosate compositions having improved herbicidal activity, optionally for use in conjunction with agriculturally-acceptable inorganic ammonium salts, and having a relatively low amount of surfactant."

4.1 In paragraph 2.2 it went on to state that "in the light of the evidence presented in the specification, this problem appears to have been solved by the compositions as defined in the claims according to the main request and auxiliary request".

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4.2 Only in the following paragraph 2.3 of its decision did the opposition division make it clear that it considered the content of citations (6), (8) and (9) as a whole to be the closest state of the art. In this respect it should, however, be noted that the cited documents refer to a broad variety of glyphosate formulations containing, on the one hand,

(a) different sources of the glyphosate component, for example, glyphosate acid

- solubilised by means of a nonionic surfactant,
- in the form of its salts with an agriculturally acceptable cation,

- in the form of the free acid, or
- as the commercial product Roundup<sup>R</sup>, which itself contains a significant amount of ethoxylated fatty amines surfactant,

and on the other,

(b) different sorts of surfactants, including, amongst the less hydrophilic ones of the formula given in claim 1 of the patent in suit, a number of other surfactants, for example, more hydrophilic surfactants which are used in commercially available glyphosate formulations and are outside the scope of the present claims.

4.3 In spite of this broad spectrum of glyphosate formulations disclosed in the state of the art according to (6), (8) and (9), there is no indication in the impugned decision of a specific disclosure in the cited state of the art which actually served as the basis for the definition of the problem to be solved. Nor is there an indication of the specific state of the art chosen for comparison which lead the opposition division to the conclusion that the problem indicated in the impugned decision, namely the provision of "commercial glyphosate compositions having improved herbicidal activity", had been solved (see point 4.1 above).

5. When determining the closest state of the art in the present case, it should be borne in mind that glyphosate formulations containing as the sole surfactant (b) a mixture of amines having the formula given in claim 1 of the patent in suit are already disclosed in citations (6), (8) and (9). This means that, contrary to what the appellant appeared to

suggest in his submissions in the course of the proceedings before the opposition division and the board, the specific choice of the surfactant (b) in the patent in suit is not a distinguishing feature over the closest state of the art and cannot therefore be taken into consideration for the definition of the problem to be solved and, hence, for the assessment of inventive step.

5.1 In view of the foregoing and as a consequence of the amendments mentioned in point 2 above, the board considers that the closest state of the art is represented by the following embodiments in the cited state of the art:

(i) by the compositions (formulations) referred to in Table 8 on page 143 of (6), containing as the component (a) the Ethomeen S12 salt of glyphosate acid and as the component (b) 5 g/l Ethomeen C12 or 5 g/l Ethomeen C15 in the absence of both ammonium sulphate and an additional secondary surfactant; and

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(ii) by the composition (formulation) referred to in Table 7 on page 143 of (8), entry 5, containing as the component (a) the isopropylamine salt of glyphosate acid and as the component (b) 0.5% Ethylan TF in the absence of both ammonium sulphate and an additional secondary surfactant.

(ad i) The Ethomeen S12 salt of glyphosate used in (6) is present as glyphosate solubilised by means of the surfactant Ethomeen S12 and as such indisputably falls within the definition of "solubilised glyphosate" given for component (a) in claim 1. Both surfactants Ethomeen C12 and Ethomeen C15 are fully covered by the

formula given for the surfactant (b) in claim 1 of the patent in suit (see eg (6) Table 1, entries 2 and 3). The above-mentioned formulations in (6) are therefore considered to represent the closest state of the art in respect of the embodiment of the claimed invention, wherein the glyphosate is present as glyphosate solubilised by means of the surfactant b).

(ad ii) The appellant confirmed during the oral proceedings before the board that Ethylan TF belongs to the class of fatty amines ethylene oxide surfactants covered by the formula given for the surfactant (b) in claim 1 of the patent in suit. The above-mentioned formulation in (8) is therefore considered as being the closest state of the art in respect of the embodiment of the claimed invention, wherein the glyphosate is present as a salt of glyphosate acid with an agriculturally acceptable cation other than the cation form of the surfactant.

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5.2 It is apparent from the observations in points 5 and 5.1 above that the essential distinguishing feature of the glyphosate formulations according to present claim 1 over the closest state of the art according to (6) and (8) is the weight ratio of the solubilised glyphosate (a) (expressed as glyphosate acid equivalent) to the surfactant (b).

5.3 As has been admitted by the appellant during the oral proceedings before the board, a direct comparison between the herbicidal properties and effects of the claimed formulations in the patent in suit and those in the closest prior art identified for the first time at the appeal stage is not yet available in the documents on file.

- 5.4 The comparative data presented in the specification of the contested patent and so far relied on by the appellant in support of inventive step apparently concern commercially available products which all differ from both the above-identified closest state of the art and the claimed formulations in the patent in suit by the nature of the surfactant (b).

For the assessment of inventive step it is irrelevant, however, if the claimed formulations possibly exhibit some unexpected advantageous effects compared to less close or structurally remote prior art, as long as they are in the present case derivable, together with the required function, from some other, more relevant known formulations, which represent, for this very reason, the "closest" state of the art (see points 5, 5.1 and 5.2 above). This is why, contrary to the appellant's submissions and the opinion of the opposition division (see point 4.1 above), the results of the comparative experiments in the examples of the patent in suit are irrelevant to the definition of the problem underlying the invention, and hence to the assessment of inventive step in the present case. A possible technical progress or advantage shown in comparison with commercially available products cannot be a substitute for the demonstration of inventive step with regard to the closest prior art.

6. In view of the foregoing, the board considers it appropriate for the opposition division to assess the question of inventive step at issue, as requested by the appellant. Under the circumstances of the case, it would not appear to be in accordance with the nature of an appeal procedure and the board's obligation to examine the appeal, if the substantively restricted independent claim were examined for the first time on

appeal. Rather, in the board's view, the appellant should be given an opportunity to defend his case before two instances, in view of the fact that in the appeal an entirely new situation has been created

- by the substantial amendments made,
- by the determination of the closest state of the art in respect of the restricted claims for the first time at the appeal stage, and
- by the board's conclusion to consider the comparative evidence provided in the specification of the patent in suit as being irrelevant to the assessment of inventive step, in spite of the fact that this evidence was accepted by the opposition division to substantiate the successful solution of the problem defined in the impugned decision.

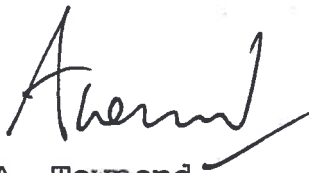
7. Since the board has decided to use its discretion under Article 111(1), second sentence, EPC, and remit the case to the first instance for further prosecution on the basis of the main request, there is no need for it to consider the auxiliary request.

**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 for further prosecution on the basis of claims 1 to 6 submitted as the main request during the oral proceedings.

The Registrar:



A. Townsend

The Chairman:



R. Teschemacher

GR

JK