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**Datasheet for the decision
of 28 January 2016**

Case Number: T 1844/11 - 3.3.09

Application Number: 04793705.7

Publication Number: 1684794

IPC: A61K38/43, A23K1/165

Language of the proceedings: EN

Title of invention:
ALTERING ANIMAL WASTE COMPOSITION

Applicant:
AgResearch Limited

Headword:

Relevant legal provisions:
EPC Art. 123(2), 54, 56

Keyword:
Amendments - added subject-matter (no)
Novelty - (yes)
Inventive step - (yes)

Decisions cited:

Catchword:



**Beschwerdekammern
Boards of Appeal
Chambres de recours**

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Case Number: T 1844/11 - 3.3.09

**D E C I S I O N
of Technical Board of Appeal 3.3.09
of 28 January 2016**

Appellant:
(Applicant)

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Decision under appeal:

**Decision of the Examining Division of the
European Patent Office posted on 7 February 2011
refusing European patent application No.
04793705.7 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman J. Jardón Álvarez
Members: M. O. Müller
D. Prietzel-Funk

Summary of Facts and Submissions

I. European patent application No. 04 793 705.7, filed as international application PCT/NZ2004/000241 in the name of AgResearch Limited was refused by the examining division.

II. The documents cited in the supplementary European search report and in the international search report included

D1: US 4,517,004 A; and

D16: WO 02/19809 A1.

III. The decision of the examining division was based on a main and a first auxiliary request. Claim 1 of the main request read as follows:

"1. A delivery device for altering the composition of animal waste, characterised in that the delivery device is adapted to deliver internally to an animal one or more substances capable of directly or indirectly affecting the conversion of nitrogen containing compounds in animal waste, the delivery device being configured such that the animal waste acts as a carrier so that the one or more substances affect the conversion of nitrogen containing compounds once the waste is excreted from the animal."

Claim 1 of the first auxiliary request differed from claim 1 of the main request in that after "characterised in that", the wording "the delivery device comprises one or more treatment substances including a urease inhibitor or a nitrification inhibitor and is configured as a ruminal bolus for oral

administration to an animal or a slow release device configured for insertion into an animal's bladder" was added.

- IV. In its decision, the examining division held that the subject-matter of claim 1 of the main request lacked novelty over D1. The examining division in particular reasoned as follows: "Claim 1 discloses a delivery device for altering the composition of animal waste. However, the delivery device is defined in claim 1 by functional terms. Therefore, any device/product that is able to alter the composition of animal waste will fall within the range of claim 1. Thus, since document D1 (column 8, lines 54-64) teaches the use of urease inhibitors in feed additives which can alter the composition of the animal waste, the subject-matter disclosed in claim 1 is not new."

Furthermore, the subject-matter of claim 1 of the first auxiliary request was considered to lack inventive step over D1. The subject-matter of claim 1 differed from the closest prior art D1 in terms of the specific administration forms, i.e. the ruminal bolus or the slow release device, by which the urease or nitrification inhibitor was administered to the animal. Since no technical effect was presented for this difference, the problem to be solved was the provision of alternative forms of administration for the urease or nitrification inhibitor. The use of a ruminal bolus or slow release device was one of the obvious possibilities the skilled person would have considered.

- V. The applicant (hereinafter: the appellant) appealed this decision. The statement setting out the grounds of appeal contained a main request and first, second and

third auxiliary requests as well as the following documents:

- D13: C. J. Watson, "Urease Activity and Inhibition-Principles and Practice", paper presented to The International Fertiliser Society at a meeting in London on 28th November 2000, Proceedings No 454, pages 1 to 39;
- D14: K. A. Dawson et al., "Digestive disorders and nutritional toxicity", 1997, The Rumen Microbial Ecosystem, P. N. Hobson and C. S. Stuart (editors), second edition, Springer, 1 page; and
- D15: W. Zhengping et al., "Effect of organic matter and urease inhibitors on urea hydrolysis and immobilization of urea nitrogen in an alkaline soil", Biol. Fertil. Soils, volume 11, 1991, pages 101 to 104.

- VI. In its subsequently-issued preliminary opinion the board raised various objections under Articles 84 and 123(2) EPC as well as a novelty objection against the composition claims present in the then main request.
- VII. In response to the board's communication, the appellant filed a new main request.
- VIII. During the oral proceedings on 28 January 2016, the appellant filed claims 1 to 20 as new main request together with adapted description pages and withdrew all other requests on file.

The independent claims of the only request read as follows:

"1. A method of altering the composition of animal waste,

characterised by the step of

introducing internally to an animal a nitrification inhibitor that can directly or indirectly affect the conversion of nitrogen containing compounds in animal waste once the animal waste has been excreted."

"2. A delivery device for altering the composition of animal waste,

characterised in that

the delivery device is adapted to deliver internally to an animal a nitrification inhibitor that can directly or indirectly affect the conversion of nitrogen containing compounds in animal waste once the animal waste is excreted from the animal."

"19. The use of a nitrification inhibitor in the manufacture of a delivery device as claimed in any one of claims 2 to 18."

IX. The appellant's position, as far as relevant to the present decision, can be summarised as follows:

By deleting the claims or passages in the claims that had been objected to by the board under Article 84 EPC, the objections had been resolved.

Furthermore, the claimed subject-matter was novel over D1. This document predominantly taught methods of increasing the amount of soil nitrogen by applying

compounds that inhibited urease activity and/or nitrification to soil growth media. Contrary thereto, the nitrification inhibitors to be utilised according to the present claims were administered to an animal as opposed to being directly applied to soil growth media as taught in D1. D1 also mentioned other applications such as the application as feed additives, where urease inhibitors were introduced into an animal. However, as evidenced by D13 and D15, the phosphorous compounds disclosed in D1 did not have nitrification inhibiting properties. Therefore the use as feed additives did not imply the incorporation of nitrification inhibitors into animals, as required by the present claims. Lastly, by deleting the composition claims, the board's novelty objection against these claims had been met.

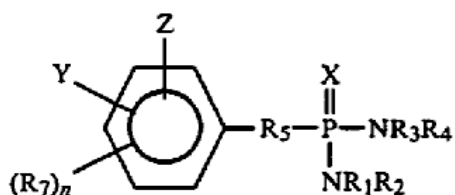
The claimed subject-matter was also inventive in view of D1. The claimed invention was limited to the class of nitrification inhibitors. These were different compounds to the class of urease inhibitors disclosed in D1. Furthermore, the skilled person would assume that a compound as disclosed in D1, if administered to an animal, would likely be broken down as it proceeded through the digestive tract and thus would be highly unlikely to be excreted by the animal in an active form. The skilled person would therefore not take the disclosure of D1 and extend it so as to administer a nitrification inhibitor internally to an animal to thereby affect conversion of nitrogen-containing compounds after being excreted from the animal.

- X. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of claims 1 to 20 submitted on 28 January 2016, description pages 1 to 28 submitted on 28 January 2016

and figure pages 1/9 to 9/9 as published in
WO 2005/030247 A1.

Reasons for the Decision

1. Allowability of amendments (Article 123(2) EPC)
 - 1.1 Claims 1 and 2 are based on claims 28 and 1 as filed, respectively, each in combination with
 - page 6, lines 20 to 23 and claim 5 as filed (treatment substance as referred to in claims 28 and 1 as filed is a nitrification inhibitor), and
 - page 8, line 19 as filed (introduction internally to an animal).
 - 1.2 Claims 3 to 18 and 20 are based on claims 2, 6, 7, 13 to 17, 20 to 24, 26, 3, 4 and 29 as filed.
 - 1.3 Claim 19 is based on page 13, lines 14 to 16 in conjunction with page 6, lines 20 to 23 and claim 5 as filed.
 - 1.4 The claims thus meet the requirements of Article 123(2) EPC.
2. Novelty
 - 2.1 D1 discloses various types of application of aryl phosphoric triamide and aryl phosphorodiamidate compounds of the formula



with groups X, Y, Z and R₁₋₇ being broadly defined.

2.2 The type of application that, in terms of technical features, comes closest to the claimed subject-matter is that disclosed in column 8, lines 60 to 63 of D1, namely the use of the above aryl phosphoric triamide and aryl phosphorodiamidate compounds as urease inhibitors in animal litters, as feed additives, in pharmaceutical applications, and for urease inhibition in mammalian urinary tracts.

2.2.1 An application of a urease inhibitor as feed additive implies that the urease inhibitor is fed to and thus introduced internally to an animal. Also the use for urease inhibition in mammalian urinary tracts implies the introduction of the urease inhibitor into an animal. In both cases, the urease inhibitor can directly or indirectly affect the conversion of nitrogen-containing compounds in the animal's waste once the animal waste has been excreted. The features of the present independent claims of the internal introduction into an animal and the direct or indirect affection of the conversion of nitrogen containing compounds in animal waste are thus disclosed in the above passage of D1.

However, contrary to the claims which all require that the compound introduced internally to an animal is a nitrification inhibitor, the above passage in column 8 of D1 refers to urease inhibitors. Nitrification and urease inhibitors are different in that the first

inhibit the transformation of ammonium into nitrate and nitrous oxide by bacteria while the latter inhibit the enzyme urease, which hydrolyses urea into carbon dioxide and ammonium. Consequently, the subject-matter of all claims differs from the type of application disclosed in column 8 of D1 in that the compound introduced internally into an animal is a nitrification inhibitor rather than a urease inhibitor.

2.2.2 This finding is not altered by the fact that the phosphorous compounds disclosed in D1 as urease inhibitors are also referred to in this document as nitrification inhibitors (column 3, lines 46 to 52). More specifically, cyclohexylphosphoric triamide, phenyl phosphorodiamidate and N-(n-butyl) thiophosphoric triamide, three phosphorous compounds belonging to the class of phosphorous compounds disclosed in D1, do not represent nitrification inhibitors. This follows from D13 (point 7.5 on page 26), where it is stated that these phosphorous compounds do not have antibacterial activity, which implies that they do not prevent bacteria from transforming ammonium into nitrate and nitrous oxide. Furthermore D15 (figure 3a) shows that one of these phosphorous compounds, phenyl phosphorodiamidate, actually promotes rather than inhibits nitrification. In particular, the amount of nitrate and nitrous oxide obtained with phenyl phosphorodiamidate (open triangles in the figure) is higher than that obtained with a control without phenyl phosphorodiamidate (open squares in the figure).

It can thus be assumed that the phosphorous compounds referred to in the above-discussed passage in column 8 of D1 as urease inhibitors are indeed effective as urease rather than nitrification inhibitors.

2.2.3 Even if, for the sake of argument, some of the phosphorous compounds of D1 were considered to be effective as nitrification inhibitors too, novelty would still have to be acknowledged. In this case, the claimed subject-matter could only be arrived at by making a double selection, namely by selecting a specific urease inhibitor out of those disclosed in D1 that is effective as nitrification inhibitor too and by choosing the specific type of application disclosed in column 8 of D1, namely as feed additive or for urease inhibition in mammalian urinary tracts, among the various other types of application disclosed in this document (see point 2.3 below). There is no pointer to such a double selection in D1. On the contrary, D1 focuses on the inhibition of the hydrolysis of urea rather than on the inhibition of nitrification and the major part of D1 deals with applications different from the use as feed additives or for urease inhibition in mammalian urinary tracts.

2.3 Apart from the type of application disclosed in column 8 of D1, this document discloses and actually focuses on the use of the phosphorous compounds in various other types of application, namely

- the use in a fertilizer composition (column 2, line 18 to column 3, line 11),
- the distribution in a plant growth medium to enhance the yield and/or growth of plants (column 3, lines 12 to 22),
- the application to a plant growth medium to inhibit the urease catalysed hydrolysis of urea

applied to this plant growth medium (column 3, lines 23 to 45), and

- the application to a plant growth medium in order to inhibit the nitrification of ammonium nitrogen which may be present in said plant growth medium (column 3, lines 46 to 52).

For all these types of application, the same applies as discussed above in point 2.2, namely that the phosphorus compounds disclosed in D1 are urease rather than nitrification inhibitors. Hence, this is a first distinguishing feature. Furthermore, in all these types of application, the phosphorous compounds are directly applied to the plant growth medium, namely by e.g. spraying, dusting or distributing it in irrigation water (column 4, lines 60 to 61). Contrary thereto, the claims require the (device to be adapted to the) indirect application to the plant growth medium (soil), namely after introduction to an animal.

2.4 The subject-matter of all claims is thus novel over D1.

2.5 The subject-matter of the present claims is ultimately not disclosed in any of the further documents cited in the search reports.

3. Inventive step

3.1 The invention, in its broadest sense, concerns the minimization of nitrogen loss from the soil (page 2, lines 11 to 12 in conjunction with, e.g., page 7, lines 13 to 17).

3.2 The type of application disclosed in column 8 of D1, which is directed to the use in animal litters, as feed

additives, for pharmaceutical applications, and for urease inhibition in mammalian urinary tracts (see point 2.2 above) is entirely unrelated to the minimization of nitrogen loss from the soil. In fact D1 mentions this type of application in the context of non-agricultural applications only (column 8, lines 54 to 59). This type of application of D1 thus does not qualify as the closest prior art.

3.3 The other types of application disclosed in D1 (see point 2.3 above) are all directed to the avoidance of nitrogen loss from the soil (column 1, lines 25 to 32). Therefore, these types of application of D1 can be considered to represent the closest prior art.

3.3.1 As set out above, the claimed subject-matter differs from these types of application *inter alia* in that (a delivery device is configured such that) the nitrification inhibitor is internally introduced to an animal and thereby delivered to the soil together with the animal's waste when it is excreted. Contrary thereto, the inhibitor in D1 is applied directly to the soil by spraying, dusting or distributing it in irrigation water.

3.3.2 As set out on page 3, lines 9 to 13 of the present application, the application of inhibitors over large areas by spraying, dusting or distributing them in irrigation water is problematic. It is difficult to ensure complete and sufficient contact with the nitrogen sources. Furthermore, the inhibitors may break down in the environment before being of use, or leach through to the ground water. Hence, the problem to be solved over D1 may be seen in the provision of a method and device that allows a more efficient avoidance of nitrogen loss in the soil.

3.3.3 As a solution to this problem, the present application proposes a method and device as claimed, characterised in that the nitrification inhibitor is introduced internally into an animal such that it is excreted to the soil together with the animal's waste.

3.3.4 As set out in the present application (page 8, lines 14 to 18), delivering the nitrification inhibitors to the soil together with the animal waste being excreted from the animal means no or little delay in inhibiting nitrification since the nitrification inhibitor is brought onto the soil together with the nitrogen compounds in the animal waste. Further, this ensures that the nitrification inhibitors are only delivered to the portion of pasture/soil on which the animal excretes its waste, eliminating the need to apply the nitrification inhibitors over a large area of pasture.

It is thus credible that by way of the claimed subject-matter, the problem of providing a method and device that allows a more efficient avoidance of nitrogen loss in the soil has been solved. This problem thus constitutes the objective technical problem.

3.3.5 The claimed solution is not obvious over D1. This document does not suggest anywhere that in order to more efficiently avoid nitrogen loss in the soil, a nitrification inhibitor should be introduced internally into an animal so that it is distributed to the soil via the animal's waste. More specifically, the only passage of D1 where an introduction internally into an animal is disclosed is the above discussed passage in column 8 (point 2.2). As set out above however, this passage refers to urease inhibitors and is entirely unrelated to the prevention of nitrogen loss from the

soil. The skilled person trying to more efficiently avoid nitrogen loss in the soil and reading this passage would thus not have had any reason to introduce a nitrification inhibitor internally into an animal or to configure a device accordingly.

Finally, such a suggestion is not present in any of the further documents cited in the international search report.

- 3.3.6 Therefore, the subject-matter of all claims is inventive in view of D1 as the closest prior art.
- 3.4 Apart from D1, D16 can also be considered to represent the closest prior art since this document is directed to the use of nitrification inhibitors to prevent losses of nitrogen in the soil and addresses the problems occurring when these inhibitors are directly sprayed on the soil (paragraph bridging pages 1 and 2).
 - 3.4.1 D16 discloses a device to be fixed on the outside of an animal, the device dispensing a nitrification inhibitor when the animal is urinating. All claims of the main request differ from the disclosure of D16 in that the nitrification inhibitor is introduced internally into the animal and the device is accordingly adapted to deliver the inhibitor internally.
 - 3.4.2 As set out in the present application, which discusses D16, attaching the nitrification inhibitor containing device on the outside of the animal poses the problem that regular checking and maintenance is required to ensure that the device contains sufficient inhibitor, has not been knocked or rubbed off and has not become fouled or otherwise blocked (page 3, lines 17 to 22 of the present application). The problem to be solved over

D16 thus is the provision of a method and device which allows easy handling.

3.4.3 Introducing the nitrification inhibitor internally into the animal eliminates the need for attaching devices to the exterior of the animal, and thus avoids the need for regular maintenance to ensure that they contain sufficient modifiers, have not been damaged, or have not become fouled or otherwise blocked (page 8, lines 19 to 22 of the present application). It is thus credible that the above problem is solved by the claimed subject-matter. This problem therefore constitutes the objective technical problem.

3.4.4 Neither D16 nor any other document provides any motivation to solve this problem in the way it is solved by the subject-matter of the present claims, namely by introducing the nitrification inhibitor internally into an animal or configuring a device accordingly. Therefore, the subject-matter of all claims is inventive in view of D16 as the closest prior art.

4. The examining division refused the application because in its view the teaching in D1 of urease inhibitors in feed additives was novelty-destroying for the subject-matter of claim 1 of the then pending main request and made obvious the subject-matter of claim 1 of the then pending first auxiliary request.

The use of urease inhibitors has been deleted from the present independent claims. The examining division's objections therefore no longer apply to the presently claimed subject-matter.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the examining division with the order to grant a patent on the basis of
 - claims 1 to 20 of the main request submitted on 28 January 2016,
 - description pages 1 to 28 submitted on 28 January 2016 and
 - figure pages 1/9 to 9/9 as published in WO 2005/030247 A1.

The Registrar:

The Chairman:



M. Cañueto Carbajo

J. Jardón Álvarez

Decision electronically authenticated