THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 29

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CALVIN F. KONZAK and ENRIQUE A. POLLE

Appeal No. 1996-0212
Application No. 08/261,759[1]

ON BRIEF

Before JOHN D. SMITH, OWENS, and LIEBERMAN, Administrative Patent Judges.

JOHN D. SMITH, Administrative Patent Judge.

DECISION ON APPEAL

[1] Application for patent filed June 17, 1994. According to appellants, the application is a continuation of Application 07/981,748, filed November 24, 1992, now abandoned; which is a continuation in part of Application No. 07/858,401, filed March 26, 1992, now abandoned; which is a continuation of Application No. 07/761,250, filed September 18, 1991, now abandoned; which is a continuation of Application No. 07/270,737, filed November 14, 1988, now abandoned.

This is an appeal pursuant to 35 U.S.C. § 134 from the final rejection of claims 1-29 and 31-41.

Representative claims 31, 6, 1, and 21 are reproduced below:

31. A liquid aqueous foliar fertilizer for plant nutrition, produced by the following process:

mixing at least one water miscible polyhydroxy alcohol with at least one phosphoric acid;

heating the mixture from the previous step to temperatures in excess of 150°C to remove water in the presence of reaction promoters therefrom and cause esterification;

esterifying phosphorus contained in said mixture to produce an esterified reaction product containing phosphate esters; and

adjusting the reaction product to a pH level suitable for application to foliage of plants being fertilized.

6. A liquid aqueous foliar fertilizer for plant nutrition, comprising:

at least one liquid phosphate ester; and

at least one hygroscopic agent in sufficient quantity to extract moisture from the atmosphere to help maintain applied foliar fertilizer in liquid form on the foliage for from 1 to 7 days;

said at least one phosphate ester being selected from the group consisting essentially of an alcohol phosphate ester, a

polyhydroxy alkane alcohol phosphate ester, and a orthophosphate alcohol ester;

said at least one liquid phosphate ester being present in a collective concentration of approximately one half molar or greater; and

said at least one liquid hygroscopic agent being present in a collective concentration of approximately one molar or greater.

1. A method of fertilizing comprising the step of spraying a hygroscopic liquid onto plants at an application rate no greater then [sic, than] twenty gallons per acre, wherein the liquid includes at least one phosphate ester, sufficient hygroscopic liquid to maintain the spray in a liquid state between 1 and 7 days and has a concentration of phosphate ester between 0.5 to 4 molar.

21. The combination of liquid aqueous foliar fertilizer and plants, comprising:

an effective amount of at least one phosphate ester compound in sufficient concentration in said liquid aqueous foliar fertilizer to be of nutritional value to plants on the plants in a volume of lower than twenty gallons of said liquid aqueous foliar fertilizer per acre of plants;

an hygroscopic agent in said liquid aqueous foliar fertilizer which extracts available moisture from the atmosphere to help maintain applied aqueous fertilizer in liquid form on the foliage for from 1 to 7 days; and

a water miscible foliage adhering agent in said liquid aqueous foliar fertilizer for enhancing retention of the fertilizer when applied to the surface of the foliage.

The references of record relied upon by the examiner are:

Nooden et al. (Nooden)	4,581,056	Apr. 8, 1986

Borisov et al. (Borisov)[2] 566,809 Jul. 30, 1977
Soviet Union patent

The appealed claims stand rejected under 35 U.S.C. § 103 as unpatentable over Borisov combined with Nooden.

The subject matter on appeal is directed in a broad sense to an aqueous foliarly applicable phosphate ester fertilizer. As evident from appealed claim 31 reproduced above, in one embodiment of appellants' invention, the claimed fertilizer is defined by a process of making it wherein a phosphoric acid/ polyhydroxy alcohol mixture is heated in the presence of "reaction promoters" to produce a reaction product containing phosphate esters and wherein the pH of the produced reaction product is adjusted to a level suitable for foliar applicaion. Appealed composition claim 6 defines a liquid aqueous foliar fertilizer as comprising at least one liquid phosphate ester and at least one hygroscopic agent. Appealed claim 1 is directed to a method of fertilizing by spraying a hygroscopic liquid onto plants at a certain application rate wherein the hygroscopic liquid includes at least one phosphate ester and

[2] Our consideration of Borisov is based on the English translation of record.

sufficient hygroscopic liquid to maintain the spray in a liquid state. Appealed claim 21 defines a combination of liquid aqueous fertilizer and plants wherein the fertilizer is in a volume of lower than twenty gallons per acre of plants.

Initially, we discuss the question of whether "product-by-process" claim 31 defines patentable subject matter when compared to the prior art fertilizer described by Borisov. In a manner and procedure similar to the process used by appellants to form the claimed fertilizer, Borisov forms a mixture of a phosphoric acid (orthophosphoric acid) and a polyhydroxy alcohol (ethylene glycol) which is heated to 140EC to produce an aqueous solution of "glycol orthophosphate" which may be in the form of a mono-, di-, or triester. This solution is neutralized with appropriate amounts of solutions of potassium or ammonium hydroxide or with magnesium or <u>calcium</u> <u>oxide</u> to produce mono or disubstituted salts of the "glycol orthophosphate" ester. As noted above, appellants' fertilizer is made by a similar process, however, a "reaction promoter" such as calcium oxide is present when appellants' phosporic acid/polyhydroxy alcohol reaction mixture is heated, and appellants heat the mixture to somewhat higher

temperatures, e.g., in excess of 150EC. Appellants explain in their specification at pages 22-23 that the “reaction promoter” allows esterification to proceed at greater reaction rates at higher reaction temperatures, and Polle reports in his declarations that the degree of esterification of reaction products formed using the “claimed procedure” was 93 percent while the Borisov procedure produced a degree of esterification of 60 percent. Particularly, see page 2 of the declaration executed by Polle on September 20, 1993.

Notwithstanding the process differences noted above, it reasonably appears that the fertilizer defined by appealed product-by-process claim 31 is the same as or only slightly different from the prior art fertilizer described by Borisov.

In re Thorpe, 777 F.2d 695, 697, 227 USPQ 964, 966 (Fed. Cir. 1985). That appellants’ esterification process proceeds at faster rates (specification, page 23, lines 1-8) is no indication that appellants’ fertilizer differs chemically fron Borisov’s fertilizer which is produced by essentially the same reaction under essentially the same reaction conditions. Moreover, although Polle states that the degree of

esterification of Borisov's fertilizer is only 60 percent, appellants report in their own specification that the degrees of esterification achieved from their reaction "provides for conversion of a majority or more, such as approximately 60% or more of the phosphoric acid into alcohol phosphate esters." See the last full paragraph of the specification at page 28. Accordingly, the claimed product-by-process fertilzer does not differ from the prior art fertilizer in terms of the degree of esterification. Indeed, no appealed claim expressly defines appellants' phosphate ester by reference to the degree of esterification.

At page 19 of the Polle declaration executed May 24, 1993, Polle states that the "low proportion of hygroscopic material and the high percentage of salts" in the Borisov fertilizer would prevent the prior art composition from performing as a foliar fertilizer. However, there is no objective evidence of record regarding the quantity of hygroscopic material and salts which are actually present in Borisov's fertilizer. Moreover, appellants themselves contemplate the "desirable" use of monoester products which would also necessarily contain a high percentage of salts.

See the specification at page 29. In any event, there is no compelling objective evidence of record indicating that Borisov's fertilizer cannot be utilized in a foliar application as required by the preambular language of appellants' composition claims. Compare In re Pearson, 494 F.2d 1399, 1403, 181 USPQ 641, 644 (CCPA 1974). Based on the above, we sustain the examiner's rejection of appealed claim 31. Since appealed dependent claims 32-35 do not specify any compositional requirements that distinguish the claimed subject matter from that of Borisov, we also sustain the examiner's rejection of these claims.

Appealed composition claim 6 defines a liquid aqueous foliar fertilizer, inter alia, as comprising at least one liquid phosphate ester and at least one hygroscopic agent in certain functional amounts. Appellants explain in their specification at pages 6 and 7 that the hygroscopic agent may be provided "as an excess amount" of the polyhydroxy alcohol used in forming the "alcohol" phosphate ester. In this regard, we note that Borisov contemplates the formation in some embodiments of a triester reaction product. See the translation of Borisov at page 3 first full paragraph. One of

ordinary skill in this art would understand, in our view, that to produce Borisov's triester product, a stoichiometric excess of alcohol (e.g., ethylene glycol or glycerol) should be used. In any event, some unreacted alcohol would be expected to survive the Borisov procedure, and appellants acknowledge that the phosphate ester itself is inherently hygroscopic. See the specification at page 6, lines 18-21. Therefore, it is reasonable to presume that Borisov's fertilizer contains hygroscopic agent in amounts equivalent to those claimed by appellants. Again, we also observe that the claimed fertilizer and the prior art fertilizer are made by processes which are essentially identical. Compare In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433 (CCPA 1977). Thus, it logically follows that the claimed and prior art compositions should be substantially chemically identical. Accordingly, we will sustain the rejection of appealed composition claim 6. Appellants contend that appealed claims 7-20 which are dependent on appealed compostion claim 6, should be given separate consideration. However, appellants' arguments in the brief regarding these claims simply point out differences in what the claims cover. This does not satisfy the rule which

requires substantive arguments as to why the claims are separately patentable. See CFR § 1.192(c)(7) 1995. Accordingly, we have considered composition claims 6-20 as a single group and have selected appealed claim 6 for the basis of deciding this appeal from this grouping of claims. Since we sustain the rejection of appealed claim 6, we necessarily also sustain the rejection of claims 7-20.

Appealed method of use claims 1-5 and 36-40 and appealed fertilizer/plant combination claims 21-29 are another matter. As emphasized by appellants in their brief, Borisov discloses phosphate ester fertilizers only for use by application to soil, not for foliar application as claimed, and Polle has offered his opinion in the declaration executed on May 24, 1993 that “workers in this field do not conclude that fertilizer applied to soil can be used for foliar applications” because, inter alia, “the leaves and roots of plants differ in their physiology”. See the declaration at pages 10 and 11. Moreover, the examiner has referred to no disclusure in Borisov or the relied upon Nooden patent that factually supports his broad allegation that “it would have been obvious for one of ordinary skill in the art to take

known fertilizer compositions used for soil applications and also use them for 'foliar' applications." See the answer at page 5. Thus, there are inadequate facts of record based on the Borisov and Noonen disclosures to support the required finding that one of ordinary skill in this art would have been led to utilize the Borisov fertilizer in a foliar application as claimed based on a reasonable expectation of success. Accordingly, the stated obviousness rejection of appealed claims 1-5, 21-29, and 36-40 is reversed.

REMAND TO THE EXAMINER

With respect to the question of the obviousness of the subject matter on appeal herein, the examiner should reconsider the relevance of the disclosures found in a prior art publication to Koontz et al. (Koontz) relating to foliar applied phosphorus. See Koontz et al. (Koontz), "Factors Affecting Absorption and Translocation of Foliar Applied Phosphorus", Plant Physiology, (1957) 32:463-470. Specifically, Koontz indicates at page 465 that the effectiveness in supplying foliar phosphorus from two phosphorus compounds was "due to their effective retention of moisture" since these compounds "did not crystallize on the

leaflet as rapidly as" other tested compounds. Koontz further discloses that the separate addition of a hygroscopic agent such as glycerin(glycerol) to phosphate solutions greatly increased moisture retention. In light of the disclosures in Koontz, the examiner should reconsider whether one of ordinary skill in this art would have been led to add a hygroscopic agent such as glycerol to the phosphate ester fertilizer of Borisov based on a reasonable expectation of formulating a fertilizer that would have the capability of successful foliar application.

In summary, the rejection of claims 1-5, 21-29, and 36-40 is reversed. The rejection of claims 6-20 and 31-35 is affirmed. The decision of the examiner is affirmed-in-part. The application is remanded to the examiner for reconsideration of the teachings in Koontz.

No period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

This application, by virtue of its "special" status requires an immediate action. Manual of Patent Examining Procedure § 708.01 (7th ed., July 1998).

AFFIRMED-IN-PART/REMANDED

JOHN D. SMITH Administrative Patent Judge	)	
TERRY J. OWENS Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
PAUL LIEBERMAN Administrative Patent Judge	)	

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Appeal No. 96-0212
Application No. 08/261,759

APJ JOHN D. SMITH

APJ OWENS

APJ LIEBERMAN

DECISION: AFFIRMED-IN-PART/REMANDED
Send Reference(s): Yes No
or Translation (s)
Panel Change: Yes No
Index Sheet-2901 Rejection(s):

Prepared: September 10, 2002

Draft Final

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OB/HD GAU

PALM / ACTS 2 / BOOK
DISK (FOIA) / REPORT