

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

Paper No. 18

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte PAUL C. QUIMBY, JR. ANTHONY J. CAESAR, JENNIFER L. BIRDSALL,
WILLIAM J. CONNICK, JR., CLYDE D. BOYETTE, and NINA K. ZIDACK

Appeal No. 2000-1568
Application No. 08/695,249

ON BRIEF

Before WILLIAM F. SMITH, ELLIS and GRIMES, Administrative Patent Judges.
ELLIS, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal pursuant to 35 U.S.C. § 134 from the final rejection of claims 1-18, all the claims pending in the application.

Claims 1, 9 and 17 are illustrative of the subject matter on appeal and read as follows:

1. A granular biocontrol formulation comprising: (1) a biocontrol agent for an agricultural pest selected from the group consisting of insects, weeds, crop diseases, and detrimental nematodes, said agent being pathogenic upon contact or ingestion by said pest and selected from the group consisting of bacteria, fungi, viruses, microsporidians,

protozoa, nematodes and pathogenic components of said agents; (2) a water absorbent material; (3) a membrane stabilization agent; and (4) a granulating agent, wherein the biocontrol agent is in aqueous suspension, wherein the water absorbent material binds with available water in the suspension of biocontrol agent, wherein the amount of membrane stabilization agent is in the range of about 10-65% by dry weight of the complete formulation and wherein the aqueous suspension of biocontrol agent, the water absorbent material, the membrane stabilization agent and the granulating agent exist in said formulation as a blended mixture.

9. A method of preparing a biocontrol agent in a granular formulation, wherein said biocontrol agent is pathogenic upon contact or ingestion by an agricultural pest selected from the group consisting of insects, weeds, crop diseases, and detrimental nematodes and wherein said agent is selected from the group consisting of bacteria, fungi, viruses, microsporidians, protozoa, nematodes and pathogenic components of said agents, comprising the steps of:

- a. blending said biocontrol agent in aqueous suspension with a water absorbent material and a membrane stabilization agent into a dough;
- b. blending the dough of step (a) with a granulating agent to reduce said dough to discrete granules;
- c. recovering the granules of step (b).

17. The method of Claim 9 wherein the granules recovered in step (c) are redispersed in water to yield a sprayable formulation.

The references relied upon by the examiner are:

Levy	4,818,534	Apr. 4, 1989
Shasha et al. (Shasha '377)	4,859,377	Aug. 22, 1989
Shasha et al. (Shasha '697)	5,061,697	Oct. 29, 1991
Quimby, Jr. et al. (Quimby)	5,358,863	Oct. 25, 1994

Webster's II New Riverside University Dictionary, Soukhanov et al. (eds.) Houghton Mifflin Company, Boston, MA p. 67 (1984).

Connick et al. (Connick), Journal of Nematology, Vol. 25, pp. 198-203 (1993).

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The claims stand rejected as follows:

- I. Claims 1-18 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the appellants regard as their invention.
- II. Claims 1-18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shasha '697, Shasha '377, Connick, Quimby and Levy.¹

We reverse.

Background and Discussion

As indicated by the claims, the present invention is directed to a granular formulation which comprises (i) a biocontrol agent selected from the group consisting of bacteria, fungi, viruses, microsporidians, protozoa, nematodes and pathogenic components thereof, (ii) a water absorbent material (e.g., starch polyacrylonitrile graft copolymers such as "Super Slurper" and "Water-lock[®]"), (iii) a membrane stabilization agent (e.g., sucrose and disaccharides such as trehalose), and (iv) a granulating agent (e.g., diatomaceous earth, Cab-O-Sil[®], and Hi-Sil[®]), combined together in a blended mixture. The membrane stabilization agent is present in the range of about 10-65% by dry weight of the complete formulation. In addition, the invention is directed to a method

¹ In the final rejection, claims 1-18 were also rejected under 35 U.S.C. § 103 as being unpatentable over Zidack (Zidack et al., Phytopathology, "Am. Phytopathol. Soc. Annual Meeting", Vol. 85, Abstract 792 (August 12-16, 1995)), Shasha '697, Connick, Quimby, and Levy. However, since this rejection was not repeated in the Examiner's Answer, we presume that it has been withdrawn.

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of preparing a granular biocontrol agent which comprises (i) blending an aqueous suspension of a biocontrol agent selected from the group consisting of bacteria, fungi, viruses, microsporidians, protozoa, nematodes and pathogenic components thereof with a water absorbent material and a membrane stabilization agent into a dough, (ii) blending the dough of subsection (i) with a granulating agent to produce granules, and (iii) recovering the granules of subsection (ii). The granules can be dispersed in water to produce a sprayable formulation.

According to the specification, the present formulation is useful in the control of agricultural pests such as insects, weeds, crop diseases, and detrimental nematodes. Specification, p. 5.

I. § 112, second paragraph rejection

First, the examiner contends that claims 1 and 9 are vague and indefinite in the recitation of “and pathogenic components of said agents.” Answer, p. 3. According to the examiner, it is not clear which parts of the claimed biocontrol agents are pathogenic. Id. We find the examiner’s position untenable.

A seminal case which provides guidance for determining whether the claims satisfy the requirements of the second paragraph of § 112 is In re Moore, 439 F.2d 1232, 169 USPQ 236 (CCPA 1971). There, the court pointed out, inter alia, that “the definiteness of the language employed must be analyzed- not in a vacuum, but always in light of the teachings of the prior art and of the particular application disclosure as it would be

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interpreted by one possessing the ordinary level of skill in the pertinent art.” In re Moore, 439 F.2d at 1235, 169 USPQ at 238. Thus, the issue becomes would one skilled in the art have understood what is encompassed by the phrase “pathogenic components of said [biocontrol] agents.”

To that end, we find that the specification provides guidance through the example of one biocontrol agent, B.t. (Bacillus thuringiensis), wherein it discloses that the pathogenic components include vegetative cells, spores, proteinaceous crystals. Specification, p. 6, lines 18-22. More importantly, however, we agree with the appellants that should a question arise as to whether a particular component of a biocontrol agent is pathogenic, one skilled in the art would have understood that simple testing of the component in question against the appropriate pest would resolve the issue. Brief, p. 6. Thus, we find that claim 1 sets forth with a reasonable degree of precision and particularity the “metes and bounds” of the appellants’ invention with the use of phrase “and pathogenic components of said [biocontrol] agents.” In re Moore, 439 F.2d at 1235, 169 USPQ at 238.

Second, the examiner argues that claim 1 is vague and indefinite in the recitation of “about.” Answer, p. 4. According to the examiner, it is not clear “how much less than or more than the 10 or the 65%” of the membrane stabilizing agent is intended to be included or excluded. Id. We find that this argument lacks merit.

Again, considering In re Moore, and the direction provided therein by the court, we turn to the specification and find that it discloses that “the membrane stabilization agent should be in the range of about 50 mM to about 1M, or about 10-65% by dry weight of the complete formulation.” Specification, p. 9. In our view, one skilled in the art, upon reading the broad range of the membrane stabilization agent recited in the claim and the specification would have understood that the exact amount of this agent in the formulation is not critical. Thus, we agree with the appellants, that the claimed range is more for purposes of guidance in making the formulation, and not for precision.

Third, the examiner argues that

Claim 17 recites adding water, it is not clear that the granules remain as granules and do not dissolve or become adherent to each other. Claim 9 is [directed] to [the] formation of a granule, however, the admixture with more water, a solvent, would be expected to result in solvation of the material placed in the solvent. Addition of more water makes the claim indefinite as to the retention of “granular formulation” that is recited in claim 9 and in claim 17 since claim 17 is dependent upon claim 9 [

Answer, p. 4].

It is not really clear to us what the examiner’s problem is with claim 17. We find nothing indefinite with the claim language. In our view, one skilled in the art would have understood that claim 17 is directed to dispersing the granules produced by the method of claim 9 in water. Claim 17 merely adds an additional step to the method.

Accordingly, in view of the foregoing, Rejection I is reversed.

II. § 103 rejection

The examiner has premised his conclusion of obviousness on the teachings of Shasha '697, Shasha '377, Connick, Quimby, and Levy.

Shasha '697 discloses a method of making a sprayable, starch-based formulation comprising (i) biocontrol agents such as bacteria, fungi, yeasts, viruses, microsporidians, protozoa, and other pathogenic organisms, and pathogenic components thereof, and (ii) a sugary material as a sticking agent. Shasha, col. 1, lines 59-64. The starch includes any pre-gelatinized starch which will form a gel when rehydrated in an aqueous solution. Id., col. 2, lines 34-36. The preferred pre-gelatinized starch is a commercial product known as "MIRA-SPERSE®" which mostly contains amylopectin, but other sources of pre-gelatinized starch can include pearl corn starch, potato starch, tapioca starch, flours containing these starches as well as mixtures of these with waxy corn starch and high-amylose starch. Id., col. 2, lines 40-47. The sugary materials in the formulations include sucrose, glucose, fructose, mannose, " -methyl glucoside, and various corn syrups. Id., col. 2, lines 48-51. Shasha '697 further discloses that in another embodiment of the invention, the biocontrol agent, pre-gelatinized starch, and the sugar, can be admixed and applied to plant foliage as a dry formulation. Id., col. 3, lines 51-54.

Shasha '377 discloses a method of encapsulating biocontrol agents such bacteria, fungi, yeasts, viruses, microsporidians, protozoa, and pathogenic components

thereof, so that they will be suitable for use in the control agricultural pests. Shasha '377, col. 2, lines 50-54 and col. 3, lines 59-65. The encapsulation is said to extend the field life of the biocontrol agents by providing protection from environmental exposure and chemical and biological degradation. Id., col. 1, lines 7-12. The encapsulation procedure is performed by blending a biocontrol agent with an aqueous dispersion of a commercially-available, amylose-containing, pre-gelatinized starch such as pearl corn starch, potato starch, tapioca starch, flours containing these starches as well as mixtures of these with waxy cornstarch and high-amylose corn starch. Id., col. 2, lines 51-58; col. 3, lines 39-43 and 51-58. Shasha '377 discloses that the starch concentration must be in the range of about 25-40% solids by weight in order to have rapid gelling. Id., col. 4, lines 54-57. The gelled mixture is placed on trays and left to stand for thirty (30) minutes to form a non-sticky mass which is then ground into non-agglomerating particles. Id., col. 4, lines 63-69. Shasha further discloses that coating the gelled mixture with pearl cornstarch powder prior to grinding facilitates particulation. Id., col. 4, line 69- col. 5, line 2. Shasha '377 still further discloses that the presence of about 5-10% corn oil by weight (i) helps to disperse the biocontrol agent, (ii) helps to minimize clumping of the pre-gelatinized starch, and (iii) acts as a mild phagostimulant for some insects. Id., col. 4, lines 24-29.

Connick discloses a method of entrapping biocontrol agents in a cohesive dough

comprising semolina (a durum wheat flour), kaolin and peat moss. Connick, para. bridging pp. 198-199. The dough is dried on a rack at room temperature and ground into granules. Id., para. bridging pp. 199-200. Connick suggests that given the wheat flour composition of the disclosed biocontrol formulation, and its compatibility with substances like wheat bran, sugars, vegetable oils, etc., it could be formulated as a bait. Id., p. 202, col. 2, first para.

Quimby discloses a method of making an encapsulated biocontrol agent which is resistant to water evaporation. Quimby, col. 1, lines 36-38. The method involves mixing granules of biocontrol agents² with a calcium salt solution to form calcium alginate granules. Id., col. 2, lines 31-42. The granules are said to typically contain 0.7%-1.0% sodium alginate and 4.5%-5.5% kaolin. Id., col. 2, lines 42-43. The granules are thoroughly coated with an oil-in-water emulsion and an oil absorbent such as hydrated silica, fumed silica, kaolin and other clays, corn bran, oat bran, wheat bran and other brans, diatomaceous earth, zeolite and absorbent starch or combinations thereof, and allowed to dry. Id., col. 2, line 58- col. 3, line 48.

Levy discloses an insecticidal delivery composition comprising one or more solid super absorbent polymers and at least one insecticidal agent. Levy, col. 6, lines 8-14. The superabsorbent polymers are synthetic organic polymers selected from acrylamide and acrylate polymers, copolymers and ter-polymers which are capable of

² The granules are said to be made by mixing a sterile sodium alginate and kaolin solution with a culture of the biocontrol agent(s). Quimby, col. 2, lines 31-39.

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absorbing over 100 times their weight in water. Id., col. 7, lines 30-35. The compositions are said to be useful for controlling insect populations in an aquatic environment. Id., col. 1, lines 17-27.

It is well established that the examiner has the initial burden under § 103 to establish a prima facie case of obviousness. In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); In re Piasecki, 745 F.2d 1468, 1471-72, 223 USPQ 785, 787-88 (Fed. Cir. 1984). It is the examiner's responsibility to show that some objective teaching or suggestion in the applied prior art, or knowledge generally available [in the art] would have led one of ordinary skill in the art to combine the references to arrive at the claimed invention. Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc., 75 F.3d 1568, 1573, 37 USPQ2d 1626, 1629 (Fed. Cir. 1996).

Here, the examiner's rejection is not a model of clarity. Rather, we find that the examiner points, in an unfocused manner, to numerous teachings in the various references which disclose assorted limitations present in different claims, and concludes that

Insofar as both Shasha et al. references and the Quimby et al. reference disclosed using starch as an encapsulant, it would have been obvious to one of ordinary skill in the art to have used other starch compositions to effect encapsulation such as starch copolymers which contain acrylamide or acrylonitriles as disclosed in the Levy patent. In view of the combined references, the claimed invention was within the skill in the art to make and use at the time it was made and was as a whole, prima facie obvious [Answer, p. 6].

However, the examiner has failed to point to any teachings in the applied prior art, or referred to knowledge generally available in the art, which would have suggested combining the teachings of the references in order to produce a granular, biocontrol formulation comprising (i) an aqueous suspension of a biocontrol agent selected from the group consisting of bacteria, fungi, viruses, microsporidians, protozoa, nematodes, and pathogenic agents thereof; (ii) a water absorbent material; (iii) a membrane stabilization agent; and (iv) a granulating agent, wherein the membrane stabilization agent is present in the range of about 10-65% by dry weight of the complete formulation. Independent teachings of different elements present in the claims, standing alone, do not provide a reason to combine said elements into a single formulation. At best, it appears that the examiner is confusing the level of skill in the art with the teachings of the prior art. In re Kratz, 592 F.3d 1169, 1175, 201 USPQ 71, 76 (CCPA 1979) (“There is a difference between somehow substituting skill in the art for statutory prior art, as the PTO attempts to do here, and using that skill to interpret prior art”).

Thus, on this record, we are constrained to agree with the appellants that the examiner has engaged in impermissible hindsight in making his determination of obviousness. In re Gorman, 933 F.2d 982, 987, 18 USPQ2d 1885, 1888 (Fed. Cir. 1991) (“It is impermissible, however, simply to engage in a hindsight reconstruction of the claimed invention, using the applicant’s structure as a template and selecting elements from references to fill the gaps”); Interconnect Planning Corp. v. Feil, 774 F.2d

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1132, 1138, 227 USPQ 543, 547 (Fed. Cir. 1985); W.L. Gore & Assocs. v. Garlock, Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 312-313 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984) (“To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher”).

Accordingly, Rejection II is reversed.

III. Other issues

Upon return of the application to the corps, the examiner may wish to consider the following.

1. Reject the claims individually, or in the very least, identify the claim(s) to which the rejection is directed. In our reading of the examiner’s rejection in the Answer, it was never clear to us which claim(s) the examiner was addressing. The examiner would be well advised to consider the limitations present in each claim individually, starting with claim 1, and to address those limitations before moving on to other claims.

2. The issue of obviousness in view of the teachings of Shasha ‘697 and Shasha ‘377. To that end, we direct attention to the teachings of Shasha ‘697, col. 3, lines 50-54, wherein it states:

In yet another embodiment of the invention, the biocontrol agent, pregelatinized starch material, and the sugary material can be admixed and

applied to the plant foliage as a dry formulation [emphasis added].

Thus, it appears that Shasha '697 teaches a dry biocontrol formulation which comprises a biocontrol agent, a water absorbent material (pregelatinized starch),³ and a membrane stabilization agent (sucrose, etc.).

We further direct attention to the teachings of Shasha '377 with respect to the encapsulation of a biocontrol agent by uniformly dispersing said agent in an aqueous dispersion of the pre-gelatinized starch. Shasha '377, col. 4, lines 32-35. Shasha '377 further discloses that

The recovery procedure is aimed at converting the homogenous mass to discrete, free-flowing, nonagglomerating particles. In accordance with one method of recovery contemplated herein, the gelled starch-agent mixture is placed on trays and allowed to stand for about 30 min at room temperature. The resultant, nonsticky mass is then ground by suitable means into nonagglomerating particles. Coating the mass with pearl cornstarch powder prior to grinding will facilitate particulation [emphasis added].

Thus, Shasha '377 appears to disclose a granular, biocontrol formulation comprising, a biocontrol agent, a water absorbent material and a granulating agent.

Upon return of the application, the examiner may wish to consider whether it would have

³ We agree with the examiner that the claims are not limited to water absorbent materials which are capable of absorbing several times their own weight in water, as argued in the appellants' brief (Brief, p. 12). Thus, the water absorbent material recited in the claims appears to "read on" the water absorbing, pre-gelatinized starch disclosed by Shasha '697 and Shasha '377.

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been obvious to one of ordinary skill in the art to employ the granulating agent (pearl cornstarch powder) described by Shasha '377 in the dry biocontrol formulation described by Shasha '697 in order to produce particles of said biocontrol formulation.

Alternatively, the examiner might wish to consider whether it would have been obvious to those of ordinary skill in the art to add the membrane stabilization agent (sucrose) taught by Shasha '697 to the granular biocontrol formulation described by Shasha '377.

In view of the foregoing, the decision of the examiner is reversed.

REVERSED

WILLIAM F. SMITH)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
JOAN ELLIS)	APPEALS
Administrative Patent Judge)	AND
)	INTERFERENCES
)	
)	
)	
ERIC GRIMES)	
Administrative Patent Judge)	

Curtis P. Ribando
USDA Ars Ott National Center for
Agricultural Utilization Research
1815 N. University Street
Peoria, IL 61604

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JE/ki