

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

---

*Ex parte* HIROSHI KAWADA, MASAJI KIKUTA, RURIKO YOSHIDA,  
YOSHINORI TADENUMA and KIYOSHI TANIGUCHI

---

Appeal 2007-3999<sup>1</sup>  
Application 10/498,981  
Technology Center 2100

---

Decided: January 7, 2008

---

Before DONALD E. ADAMS, LORA M. GREEN,  
and RICHARD M. LEBOVITZ, *Administrative Patent Judges*.

ADAMS, *Administrative Patent Judge*.

DECISION ON APPEAL

This appeal under 35 U.S.C. § 134 involves claims 7-19, the only claims pending in this application. We have jurisdiction under 35 U.S.C. § 6(b).

---

<sup>1</sup> Heard January 22, 2008.

## INTRODUCTION

The claims are directed to a granular herbicide. Claims 7, 8, and 11 are illustrative:

7. A granular herbicide obtained by blending one other herbicide selected from the following Group A, Group B, Group C, and Group D, or one other herbicide selected from each of two said Groups, to glufosinate-ammonium, and depositing the blend on a mineral carrier having a grain size distribution of from 0.1 to 0.3 mm, wherein said other herbicide is blended in an amount effective to increase the adherence of the granular herbicide on foliage compared to the same total amount of glufosinate-ammonium without said other herbicide, wherein

Group A is a photosynthesis-inhibiting herbicide and is one or two members selected from the group consisting of isouron, karbutilate, diuron, tebuthiuron, linuron, cyanazine, prometryn, metribuzin, terbacil and bromacil,

Group B is a phytohormone herbicide and is one or two members selected from the group consisting of 2,4-D, MCPA, mecoprop, triclopyr and their salts and esters,

Group C is a protoporphyrinogen oxidase-inhibiting herbicide and is one or two members selected from the group consisting of oxadiargyl, carfentrazone-ethyl, flumioxazin, bifenox and pyraflufen-ethyl, and

Group D is another herbicide and is one or two members selected from the group consisting of diflufenican, dichlobenil and chlorthiamid.

8. The herbicide according to claim 7, wherein the other herbicide is from Group A.

11. The herbicide according to claim 7, wherein the other herbicide is from Group D.

The Examiner relies on the following prior art references to show unpatentability:

Hoechst	JP 06-078204 B	Oct. 1994 (English translation Apr. 12, 2007 <sup>2</sup> )
Hacker	US 7,012,040 B2	Mar. 14, 2006 (§ 102(e) date Aug. 10, 1999)

(Merck), THE MERCK INDEX AN ENCYCLOPEDIA OF CHEMICALS, DRUGS, AND BIOLOGICALS 3029 (11<sup>th</sup> ed., Susan Budavari et al. ed., MERCK & CO., INC. 1989).

The rejections as presented by the Examiner are as follows:

1. Claims 7-10 and 12-19 stand rejected under 35 U.S.C § 103(a) as unpatentable over the combination of Hoechst and Hacker.
2. Claim 11 stands rejected under 35 U.S.C § 103(a) as unpatentable over the combination of Hoechst, Hacker, and Merck.

We affirm.

## DISCUSSION

1. Claims 7-10 and 12-19 stand rejected under 35 U.S.C § 103(a) as unpatentable over the combination of Hoechst and Hacker.

---

<sup>2</sup> We rely on the English translation of this document. We note, however, that the English translation of this document is not paginated. Accordingly, we refer to page numbers as if the document was consecutively paginated beginning with the first page.

“Hoechst teaches a micro-granulated powder for watersoluble [sic] herbicides [including glufosinate] . . . which are coated onto an absorptive mineral carrier . . . having a grain size of 0.06 – 0.3 mm” (Answer 3-4). According to Hoechst, granular herbicidal formulations are less effective than liquid preparations (Hoechst 1: 27-28). Hoechst attributes a number of reasons for this effect including the finding that particle-like granule formulations do not adhere to the vegetable (e.g., leafy) surface of the plant as well as a liquid formulated herbicide (Hoechst 2: 3-4). Hoechst overcomes the deficiency in particle-like granule formulations by formulating the herbicides in micro granular form where the herbicides are absorbed to a mineral having a grain size range of 0.06-0.3 mm (Hoechst 2: 12-16).

Hacker teaches herbicide compositions with an effective content of (A) a broad-spectrum herbicide such as glufosinate-ammonium<sup>3</sup> and (B) one or more herbicides from the group of consisting of, *inter alia*, linuron, cyanazine, and metribuzin (Hacker, Abstract; col. 2, ll. 15-16; col. 8, l. 55; col. 7, l. 40; col. 8, l. 46; Answer 4).

According to Hacker

it has now been found that active substances from the group of . . . broad-spectrum herbicides (A) in combination with other herbicides from group (A) and, if appropriate, specific herbicides (B) interact especially favorably when they are employed in the maize crops which are suitable for the selective use of the first-mentioned herbicides.

---

<sup>3</sup> Hacker, col. 2, ll. 15-16 and col. 4, ll. 47-48 (“Glufosinate is usually employed in the form of a salt, preferably of the ammonium salt”).

(Hacker, col. 1, ll. 54-60.) In addition, Hacker discloses that his “invention therefore relates to the use of herbicide combinations for controlling harmful plants in maize crops, wherein the herbicide combination in question has a synergistically active content of” (A) a broad-spectrum herbicide such as glufosinate-ammonium and (B) one or more herbicides from the group of consisting of, *inter alia*, linuron, cyanazine, and metribuzin (Hacker, col. 1, l. 61 – col. 2, l. 56; cols. 7-8). Stated differently, “[w]hen herbicides of the type (A)+(B) are used jointly, superadditive (=synergistic) effects are observed (Hacker, col. 14, ll. 1-2).

Hacker teaches that the compositions may be “applied to the soil surface before germination” or “applied post-emergence to the green parts of the plants” (Hacker, col. 13, ll. 40-53). According to Hacker, “[i]n comparison with the individual preparations, the herbicidal compositions according to the invention are distinguished by a more rapidly commencing and longer lasting herbicidal action. As a rule, the rainfastness of the active substances in the combinations according to the invention is advantageous” (Hacker, col. 13, ll. 54-59).

Hacker also teaches that the compositions of (A)+(B) can be formulated in a number of different ways, such as wettable powders, emulsifiable concentrates, aqueous solutions, emulsions, dusts, see-dressing materials, granules for soil application or for broadcasting, or water dispersible granules, ULV formulations, microcapsules, or waxes (Hacker, col. 16, ll. 9-20).

Based on this evidence the Examiner concludes that it would have been *prima facie* obvious to the ordinary artisan at the time the invention was made to have combined . . . glufosinate with the claimed secondary herbicides on a solid

inert carrier within applicants' claimed size range because the prior art teaches the combination of such herbicides which are adsorbed on mineral carriers and formulated as solid compositions. While each of [A]pplicants' secondary herbicidal agents have not been disclosed in the cited prior art, it is *prima facie* obvious to combine two compositions each of which is taught by the prior art to be useful for the same purpose in order to form a third composition that is to be used for the very same purpose; the idea of combining them flows logically from their having been individually taught in the prior art.

(Answer 4.)

Appellants present arguments for two groups of claims: I. claims 7, 9, 10, 12, 13, and 15-19; and II. claims 8 and 14 (App. Br. 6). Accordingly, we limit our discussion to representative claims 7 and 8. 37 C.F.R. § 41.37(c)(1)(vii).

*Claim 7:*

Claim 7 is drawn to a granular herbicide. The granular herbicide of claim 7 is obtained by blending a so called "other herbicide" which is one or two herbicides selected from the group consisting of, *inter alia*, linuron, cyanazine, and metribuzin with glufosinate-ammonium and depositing the blend on a mineral carrier. Claim 7 further requires that the mineral carrier has a grain size distribution of from 0.1 to 0.3 mm. In addition, claim 7 requires that the non-glufosinate-ammonium herbicide is blended in an amount effective to increase the adherence of the granular herbicide on foliage compared to the same total amount of glufosinate-ammonium without the non-glufosinate-ammonium herbicide.

Appellants assert that their “invention is based on the discovery by Applicants that when particular other herbicides, known for use mainly for soil treatment, are blended with glufosinate, and deposited on a mineral carrier having a grain size distribution of from 0.1 to 0.3 mm, an effective granular herbicide is obtained” (App. Br. 4). We note, however, that what Appellants have discovered was suggested in the art. Specifically, a granular formulation of glufosinate with other herbicides was known in the art (Hacker, col. 16, ll. 9-20; App. Br. 4-5). More specifically, that granular herbicidal formulations comprising glufosinate that are deposited on a mineral carrier having a grain size distribution of from 0.1 to 0.3 mm were known in the art (Hoechst 2: 12-16; App. Br. 4).<sup>4</sup> It was also known in the art that the combination of glufosinate with other herbicides produces a synergistic effect (Hacker, col. 1, l. 61 - col. 2, l. 56 and col. 14, ll. 1-2). Accordingly, we do not find Appellants’ assertion persuasive.

Nevertheless, Appellants direct attention to Tables 1-3 (Specification 14, 16, and 18 respectively) of their Specification where comparative trials were performed comparing a formulation comprising only glufosinate to formulations comprising Appellants’ “inventive formulations” (App. Br. 4; First Reply Br.<sup>5</sup> 2; Second Reply Br.<sup>6</sup> 1-2). According to Appellants, the cited prior art could not have predicted the results they obtain, “whereby a herbicide mainly used for soil treatment is able to enhance the benefit of

---

<sup>4</sup> “[W]here there is a range disclosed in the prior art, and the claimed invention falls within that range, there is a presumption of obviousness.” *Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1322 (Fed. Cir. 2004).

<sup>5</sup> Received May 22, 2007.

<sup>6</sup> Received May 31, 2007.

glufosinate as a foliage-acting herbicide” (App. Br. 5). We disagree. As discussed above, Hacker teaches that the combination of glufosinate with other herbicides, including herbicides mainly used for soil treatment, produce a synergistic effect (Hacker, col. 1, l. 61 - col. 2, l. 56 and col. 14, ll. 1-2). Accordingly, contrary to Appellants’ assertion, the prior art did predict the synergistic effect of the combination of herbicides as reported in the comparative trials set forth in Appellants’ Specification.

We are not persuaded by Appellants’ argument that they have discovered that “the other herbicide [(e.g., the non-glufosinate herbicide)] enhances the ability of the glufosinate-ammonium to adhere to foliage” (App. Br. 5). As discussed above, Hoechst was interested in overcoming the problems with granular herbicidal formulations adhering to the foliage of a plant (Hoechst 2: 3-4). To overcome this deficiency Hoechst prepared micro granular herbicidal formulations (Hoechst 2: 12-16). In addition, Hacker teaches granular herbicidal formulations within the scope of Appellants’ claimed invention that can be applied to the green parts of the plants to achieve synergistic herbicidal effect (Hacker, col. 13, ll. 40-53; col. 1, l. 61 - col. 2, l. 56 and col. 14, ll. 1-2).

While Appellants’ Specification speaks of the prevention of the deterioration of the effect of glufosinate due to a change in climate, e.g., humidity (Specification 19: 1-10; Br. 4); Hacker teaches that “[i]n comparison with the individual preparations, the herbicidal compositions according to the invention are distinguished by a more rapidly commencing and longer lasting herbicidal action. As a rule, the rainfastness of the active substances in the combinations according to the invention is advantageous” (Hacker, col. 13, ll. 54-59). Thus, the advantage of preventing deterioration

of the effect of glufosinate due to change in climate as relied upon by Appellants is taught by the prior art.

On reflection, we affirm the rejection of claim 7 under 35 U.S.C § 103(a) as unpatentable over the combination of Hoechst and Hacker. Claims 9, 10, 12, 13, and 15-19 fall together with claim 7.

*Claim 8:*

Claim 8 depends from and further limits the “other herbicide” of claim 7 to a Group A herbicide, which is one or two members selected from the group consisting of isouron, karbutilate, diuron, tebuthiuron, linuron, cyanazine, prometryn, metribuzin, terbacil, and bromacil.

According to Appellants, claim 8 is “separately patentable, in view of the great variety of Group A ‘other’ herbicides exemplified. See Formulation Examples 1 through 6” (App. Br. 6). We are not persuaded.

Hacker teaches herbicide compositions with an effective content of (A) a broad-spectrum herbicide such as glufosinate-ammonium and (B) one or more herbicides from the group of consisting of, *inter alia*, linuron, cyanazine, and metribuzin (Hacker, Abstract; col. 2, ll. 15-16; col. 8, l. 55; col. 7, l. 40; col. 8, l. 46; Answer 4). Linuron, cyanazine, and metribuzin are Group A herbicides according to Appellants’ claimed invention.

While Hacker describes a number of “other herbicides” that may be combined with glufosinate-ammonium, a person of ordinary skill in the art is free to select any of these “other herbicides” for the purposes taught by Hacker, e.g., to produce a synergistically effective composition of glufosinate-ammonium and other herbicide.

As the evidence relied upon teaches a granular herbicide within the scope of Appellants' claimed invention we affirm the rejection of claim 8 under 35 U.S.C § 103(a) as unpatentable over the combination of Hoechst and Hacker. Claim 14 falls together with claim 8.

2. Claim 11 stands rejected under 35 U.S.C § 103(a) as unpatentable over the combination of Hoechst, Hacker, and Merck. Claim 11 depends from and further limits the "other herbicide" of claim 7 to a Group D herbicide, which is one or two members selected from the group consisting of diblufenican, dichlobenil and chlorthiamid.

The Examiner relies on Hoechst and Hacker as set forth above (Answer 5). The Examiner recognizes, however, that the combination of Hoechst and Hacker fails to teach dichlobenil (*id.*). To make up for this deficiency the Examiner relies on Merck to teach "that dichlobenil as [sic] useful as [a] herbicide" (*id.*).

Based on this evidence the Examiner concludes that "[i]t would have been obvious to one of ordinary skill in the art at the time of invention to combine dichlobenil and glufosinate together as a single herbicide composition" because "both agents are known to be useful as [sic] herbicide individually, combining both agents into a single composition useful for the very same purpose would be *prima facie* obvious" (*id.*). We find no error in the Examiner's *prima facie* case of obviousness.

Appellants assert that the cited prior art could not have predicted the results they obtain, "whereby a herbicide mainly used for soil treatment is able to enhance the benefit of glufosinate as a foliage-acting herbicide" (App. Br. 5). We disagree for the reasons set forth above. While Hacker

and Hoechst do not expressly teach a composition comprising diflufenican, dichlobenil, and chlorthiamid – Group D herbicides according to Appellants' claimed invention - Hacker teaches herbicidal combinations that are synergistically active, and exemplifies a number of specific herbicides that when combined with glufosinate-ammonium exhibit synergistic activity (Hacker, col. 1, l. 61 - col. 2, l. 56).

For the reasons set forth above, there is no evidence on this record that one would not have expected the same or similar synergistic activity when glufosinate-ammonium was combined with dichlobenil. “Express suggestion to substitute one equivalent for another need not be present to render such substitution obvious.” *In re Fout*, 675 F.2d 297, 301 (CCPA 1982). Moreover, “[w]hen there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that is was obvious under § 103.” *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1742(2007).

Accordingly, we affirm the rejection of claim 11 under 35 U.S.C § 103(a) as unpatentable over the combination of Hoechst, Hacker, and Merck.

## CONCLUSION

In summary, we affirm the rejections of record.

Appeal 2007-3999  
Application 10/498,981

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

**AFFIRMED**

lp

OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.  
1940 DUKE STREET  
ALEXANDRIA VA 22314