UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TETSUO NAGANO, YASUTERU URANO,
and KUMI TANAKA

Appeal 2007-3220
Application 11/035,979
Technology Center 1600

Decided: June 5, 2008

Before ERIC GRIMES, RICHARD M. LEBOVITZ, and MELANIE L. McCOLLUM, *Administrative Patent Judges*.

McCOLLUM, *Administrative Patent Judge*.

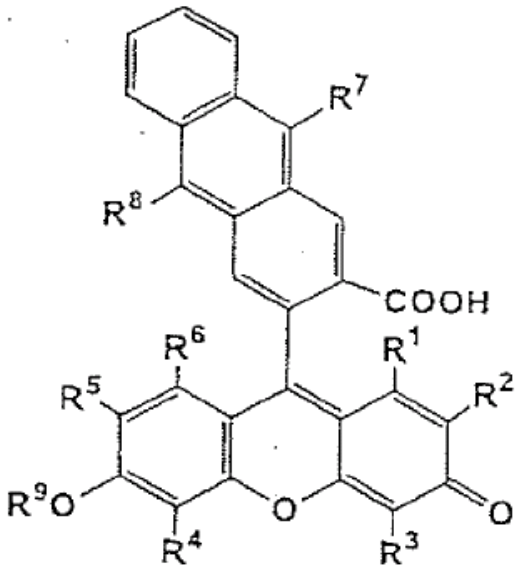
DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 involving claims to a compound. The Examiner has rejected the claims as obvious. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

STATEMENT OF THE CASE

Claims 1-15 are pending and on appeal. We will focus on independent claim 1, which reads as follows:

1. A compound represented by the following general formula (I):



wherein R^1, R^2, R^3, R^4, R^5, and R^6 independently represent a hydrogen atom, a halogen atom, a C_{1-6} alkyl group, or a C_{1-6} alkoxyl group, R^7 and R^8 independently represent a C_{1-4} alkyl group, and R^9 represents a hydrogen atom, a C_{1-12} alkanoyl group, or acetoxymethyl group, or a salt thereof.

Claims 5, 7, and 11 are also independent claims, which are directed to compounds of formulas (II)-(IV), respectively. Dependent claims 2-4, 6, 8-10, and 12-15 have not been argued separately and therefore stand or fall with claims 1, 5, 7, and 11.[1] 37 C.F.R. § 41.37(c)(1)(vii).

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[1] Appellants argue that each of claims 2-4, 6, 8-10, and 12-15 is patentable based on its dependency on another claim and because "Nagano does not teach the combination of features as recited in [the] claim" (App. Br. 19-21, 24, 27-29, and 31-34). Appellants do not argue that Nagano does not teach or suggest the additional features specifically recited in these dependent claims. Therefore, these arguments are not considered arguments for separate patentability of these claims.

Claims 1-15 stand rejected under 35 U.S.C. § 103(a) as obvious over Nagano (WO 99/51586, Oct. 14, 1999). The Examiner relies on Nagano for teaching "compounds having formulae I-IV" (Ans. 3). The Examiner finds that the "selection of some among many is prima facie obvious" (*id.* at 4).

Appellants contend that the Examiner has not set forth a prima facie case of obviousness and that any prima facie case of obviousness is overcome by unexpectedly superior results.

ISSUES

The issues are whether Appellants have shown that the Examiner erred in concluding that claims 1, 5, 7, and 11 would have been prima facie obvious and, if not, whether Appellants have presented sufficient evidence to overcome the prima facie case of obviousness.

FINDINGS OF FACT

1. Nagano describes "a substantially non-fluorescent compound represented by the . . . general formula (I) [that] efficiently reacts with singlet oxygen to give a fluorescent compound represented by the general formula (II)" (Nagano, col. 1, ll. 61-65[2]).

2. Nagano states that "singlet oxygen can be measured with extremely high specificity and sensitivity by using a compound represented by the general formula (I) as an agent for measurement of singlet oxygen, and measuring fluorescence of a compound of the general formula (II)," which is produced by reaction of the compound of formula (I) with singlet oxygen (*id.* at col. 1, l. 65, to col. 2, l. 5).

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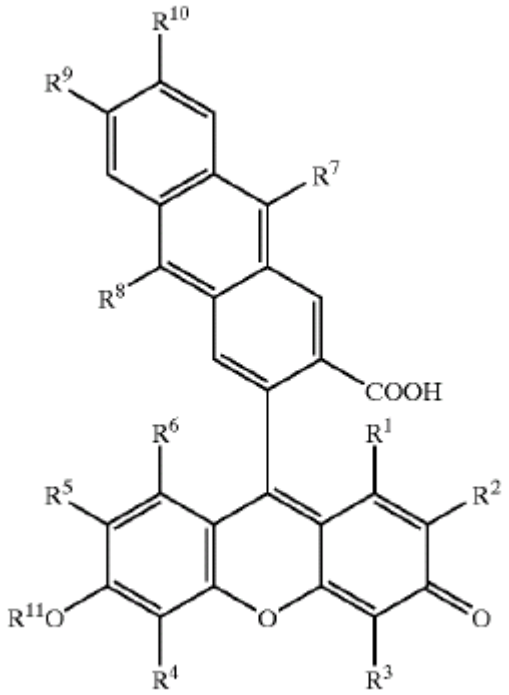
[2] The citations are to U.S. Patent No. 6,525,088 B1, which issued from the U.S. National Stage application of Nagano.

3. Nagano formula (I) is as follows:



wherein R^1, R^2, R^3, R^4, R^5, and R^6 independently represent a hydrogen atom, a halogen atom, a C_{1-6} alkyl group, or a C_{1-6} alkoxyl group, R^7 and R^8 independently represent a C_{1-6} alkyl group or an aryl group which may be substituted, R^9 and R^{10} independently represent a hydrogen atom, a C_{1-6} alkyl group, or a C_{1-6} alkoxyl group, and R^{11} represents a hydrogen atom or a C_{1-12} alkanoyl group, or salts thereof (*id.* at col. 1, l. 60, to col. 2, l. 34).

4. Nagano formula (I) encompasses many of the compounds within formula (I) of claim 1 (hereinafter "claimed formula (I)").

5. Nagano formula (I) differs from claimed formula (I) in the following respects: (1) in Nagano formula (I), R^7 and R^8 independently represent a C_{1-6} alkyl group or an aryl group which may be substituted, whereas, in claimed formula (I), R^7 and R^8 independently represent a C_{1-4}

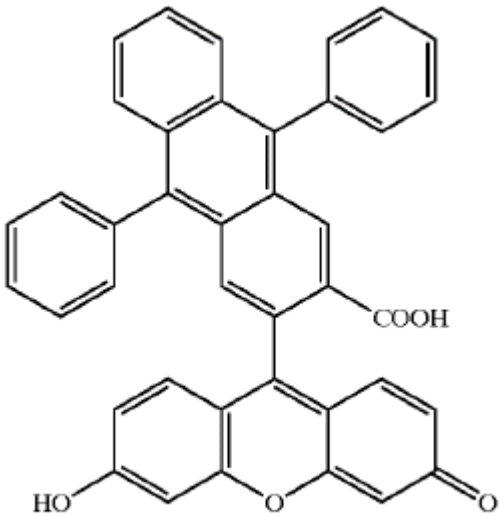
alkyl group; (2) in Nagano formula (I), R^9 and R^{10} independently represent a hydrogen atom, a C_{1-6} alkyl group, or a C_{1-6} alkoxyl group, whereas, in claimed formula (I), there are hydrogen atoms at these positions; and (3) in Nagano formula (I), R^{11} represents a hydrogen atom or a C_{1-12} alkanoyl group, whereas, in claimed formula (I), there is a hydrogen atom, a C_{1-12} alkanoyl group, or an acetoxymethyl group at this position.

6. Nagano also describes formulas (II)-(IV) (Nagano, col. 2, l. 35, to col. 3, l. 67).

7. Nagano formulas (II)-(IV) encompass many of the compounds within respective formulas (II)-(IV) of claims 5, 7, and 11 and differ therefrom in substantially the same ways that Nagano formula (I) differs from claimed formula (I).

8. Nagano states that "[i]t is preferred that R^7 and R^8 independently represent a phenyl group which may be substituted, and it is more preferred that they are both phenyl groups" (Nagano, col. 5, ll. 7-9).

9. As an example, Nagano depicts the following compound 13:



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(*Id.* at col. 12, ll. 1-17.)

10. Nagano compound 13 is within claimed formula (I) except that it has phenyl groups at positions R^7 and R^8.

11. The endoperoxide derivative of Nagano compound 13 is referred to in the present Specification as DPAX-1-EP (Spec. 18).

12. Specification compound 11 (DMAX) is within claimed formula (I). It differs from Nagano compound 13 only in that it has methyl groups rather than phenyl groups at positions R^7 and R^8. (*Id.* at 13.)

13. In Specification Example 2, DMAX-EP (the endoperoxide derivative of Specification compound 11) is compared to DPAX-1-EP (*id.* at 18).

14. The Specification states that "[p]hotobleaching of DMAX-EP was 5.4 times slower than that of DPAX-1-EP, which verified excellent light stability" (*id.*).

15. In Specification Example 3, "by using a naphthalene endoperoxide compound EP-1 . . . as a singlet oxygen generation system[, f]luorescence was measured in the presence of DMAX and DPAX-1" (*id.*).

16. The Specification states that "the increase of fluorescence intensity obtained by the addition of 0.5 mM EP-1 in the presence of DMAX was far larger than that obtained by the addition of 10 mM EP-1 in the presence of DPAX-1 . . . , which revealed that DMAX has much higher sensitivity than that of DPAX-1" (*id.*).

ANALYSIS

Nagano formula (I) encompasses many of the compounds within formula (I) of claim 1 (Findings of Fact (FF) 3-5). In addition, Nagano

formulas (II)-(IV) encompass many of the compounds within respective formulas (II)-(IV) of claims 5, 7, and 11 (FF 6-7). We conclude that the Examiner has set forth a prima facie case that claims 1, 5, 7, and 11 would have been prima facie obvious over Nagano.

With regard to claim 1, Appellants argue that they are claiming compounds "that are not sufficiently envisioned in the Nagano patent" (App. Br. 15). In particular, Appellants argue that "the compounds disclosed in Nagano include a large number of compounds that are included in the generic formula disclosed therein" (*id.*) In addition, Appellants argue that "one having ordinary skill in the art would not have been motivated to arrive at Appellant[s'] disclosed and claimed invention following the disclosure of Nagano because Nagano directs one having ordinary skill in the art to compounds wherein R^7 and/or R^8 are phenyl groups" (*id.* at 15-16).

We are not persuaded by this argument. Nagano states that "R^7 and R^8 independently represent a C_{1-6} alkyl group or an aryl group which may be substituted" (FF 3). Although Nagano states that phenyl groups are preferred (FF 8), we agree with the Examiner that it would have been prima facie obvious to select C_{1-6} alkyl groups (or aryl groups other than phenyl), including the C_{1-4} alkyl groups recited in claim 1. "[I]n a section 103 inquiry, 'the fact that a specific [embodiment] is taught to be preferred is not controlling, since all disclosures of the prior art, including unpreferred embodiments, must be considered.'" *Merck & Co. Inc. v. Biocraft Laboratories Inc.*, 874 F.2d 804, 807 (Fed. Cir. 1989) (quoting *In re Lamberti*, 545 F.2d 747, 750 (CCPA 1976)).

In addition, although Nagano formula (I) is a generic formula, we do not agree that Nagano formula (I) is so broad in comparison to claimed formula (I) that claimed formula (I) would not have been prima facie obvious. This is particularly true in view of Nagano's teaching of a specific compound that is within claimed formula (I) except that it contains phenyl groups at positions R^7 and R^8 (FF 9-10).

Appellants also argue that, "even if a *prima facie* case of obviousness were established in this case, the instantly claimed invention yields unexpected results sufficient to rebut a *prima facie* case of obviousness" (App. Br. 16). In particular, Appellants argue that "the examples in the originally filed specification establish . . . advantageous results of Appellant[s'] invention with respect to Nagano. For example, attention is directed to Appellant[s'] Example 2 wherein the results of Appellant[s'] compound DMAX-EP (Compound 11) are contrasted to DPAX-1-EP of Nagano." (*Id.*) "Still further, Applicants' Example 3 shows the advantageous stability of Appellant[s'] disclosed and claimed invention as compared to the compounds claimed in Nagano" (*id.* at 17). "Still further, Appellant[s'] recited compounds have higher water solubility than compounds as specifically disclosed by Nagano" (*id.*).

We are not persuaded by this argument. Specification Example 2 appears to demonstrate that the endoperoxide derivative of a compound within claim 1, where R^7 and R^8 each represent methyl, has greater light stability than the endoperoxide derivative of the corresponding compound where R^7 and R^8 each represent phenyl (FF 9-14). In addition, Specification Example 3 appears to demonstrate that, in the presence of singlet oxygen, a

compound within claim 1, where R^7 and R^8 each represent methyl, provides increased fluorescence intensity as compared to the corresponding compound where R^7 and R^8 each represent phenyl (FF 9-12 & 15-16). However, unlike in *In re Soni*, 54 F.3d 746 (Fed. Cir. 1995), which is relied upon by Appellants, Appellants do not argue that their Specification states that these results would have been unexpected. Instead, Appellants rely on attorney argument characterizing these results as unexpected. However, "[i]t is well settled that unexpected results must be established by factual evidence. Mere argument . . . does not suffice." *In re De Blauwe*, 736 F.2d 699, 705 (Fed. Cir. 1984). In addition, Appellants have not provided sufficient evidence supporting their assertion that their "compounds have higher water solubility than compounds as specifically disclosed by Nagano."

With regard to claims 5, 7, and 11, Appellants argue that these claims are "patentable over Nagano for substantially the same reasons as set forth with respect to independent claim 1" (App Br. 23, 26, and 30). We are not persuaded by these arguments for substantially the reasons discussed above. In addition, with regard to claims 7 and 11, it is not clear whether the allegedly unexpected results even apply to these claims.

CONCLUSION

We conclude that the Examiner has set forth a prima facie case that claims 1, 5, 7, and 11 would have been obvious over Nagano, which Appellants have not rebutted. We therefore affirm the rejection of claims 1, 5, 7, and 11 under 35 U.S.C. § 103(a). Claims 2-4, 6, 8-10, and 12-15 fall with claims 1, 5, 7, and 11.

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

AFFIRMED

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