

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. 23

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CARL E. IVERSON
and JOYCE PRINDLE

Appeal No. 1997-3892
Application 08/421,379

ON BRIEF

Before WARREN, WALTZ and LIEBERMAN, *Administrative Patent Judges*.

WARREN, *Administrative Patent Judge*.

Decision on Appeal

This is an appeal under 35 U.S.C. § 134 from the decision of the examiner refusing to allow claims 1 through 12 as amended subsequent to the final rejection, which are all of the claims in the application.¹ Claim 1 is illustrative of the claims on appeal:

1. A method for treating an irrigation system to inhibit the formation of biological fouling, comprising:

¹ See the amendment of August 26, 1996 (Paper No. 8), entered by the examiner in the advisory action of September 30, 1996 (Paper No. 10), and the amendment of February 5, 1997 (Paper No. 14), requested by the examiner (see the interview summary record, Paper No. 13) which apparently has also been entered.

providing water;
admixing with the water an effective amount of active zinc, the latter being present in the water in an amount sufficient to inhibit the growth of biological fouling in irrigation lines and emitters in the irrigation system through which water is pumped; and
pumping the water admixed with the active zinc through the irrigation lines and emitters to inhibit biological fouling.

The appealed claims as represented by claim 1 are drawn to a method for treating an irrigation system to inhibit the formation of biological fouling comprising at least the step of mixing with the irrigating water an amount of active zinc sufficient to inhibit the growth of biological fouling in the irrigation system. Claim 2 specifies that the active zinc is provided by zinc sulfate while claim 5 specifies that the active zinc is chelated with 1-hydroxy ethane 1,1-diphosphonic acid (HEDPA). Claim 9 specifies that the water-active zinc mixture is continuously pumped through the system while claim 11 specifies that such a mixture is pumped through at least one time each week. Claims 3, 7, 10 and 12 specify that about 0.1 to about 10.0 ppm of active zinc is present in the mixture.

The references relied on by the examiner are:

Alexander	4,108,772	Aug. 22, 1978
Geiger et al. (Geiger) (published Eur. Pat. Application)	0 017 373	Oct. 15, 1980

The examiner has rejected all of the appealed claims under 35 U.S.C. § 103 as being unpatentable over Geiger in view of Alexander. We reverse.

Under the provisions of 37 CFR § 1.196(b) (1997), we enter a new ground of rejection of claims 1 through 4 and 9 through 12 under 35 U.S.C. § 103 as being unpatentable over the knowledge of the problem of biological fouling of irrigation systems in the art as acknowledged by appellants in the specification combined with the teachings of Alexander.

Rather than reiterate the respective positions advanced by the examiner and appellants, we refer to the examiner's answer and to appellants' brief and reply brief for a complete exposition thereof.

Opinion

The appealed claims are drawn to methods for treating an irrigation system to inhibit the formation of biological fouling comprising at least the step of mixing active zinc with the irrigating water

in amounts sufficient to inhibit the growth of biological fouling in the irrigation system,² wherein the active zinc can be provided by zinc sulfate or an active zinc chelated with 1-hydroxy ethane 1,1-diphosphonic acid (HEDPA).

We have carefully considered the combined teachings of Geiger and Alexander in light of the positions advanced by the examiner and appellants, and find that we cannot sustain the ground of rejection based on this combination of references *per se*. We find that one of ordinary skill in this art would have drawn from the combined teachings the suggestion that the methods of treating aqueous systems wherein zinc precipitation is a problem, including cooling water systems, that involve corrosion inhibition using a composition taught by Geiger would also destroy any bacteria in the system because of the presence of zinc salts as shown by Alexander. We further find, however, that one of ordinary skill in the art would not have found in this combination of references any suggestion at all that such aqueous systems include irrigation systems. Thus, as a basic consideration, neither of the references taken singularly or as applied by the examiner, teaches or suggests an irrigation system as specified in the appealed claims, such that it is inescapable that the references as combined by the examiner, taken as a whole, would not have resulted in the claimed method. *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1050-54, 5 USPQ2d 1434, 1438-41 (Fed. Cir. 1988).

We enter the following new ground of rejection of claims 1 through 4 and 9 through 12 under 37 CFR § 1.196(b) (1997). We find that appellants acknowledge in their specification that biological fouling of irrigation systems and inhibiting such condition by flushing these systems with an excess of chlorine was known in the art before the claimed invention was made, and that such biological fouling would include bacterial growth (page 1, lines 12-30, and page 3, lines 36-37). It is well settled that “[t]he significance of evidence that a problem was known in the prior art is, of course, that knowledge of a problem provides a reason or motivation for workers in the art to apply their skill to its solution.”

² See generally, *Exxon Chemical Patents Inc. v. Lubrizol Corp.*, 64 F.3d 1553, 1555, 35 USPQ2d 1801, 1802 (Fed. Cir. 1995) (“The claimed composition is defined as comprising - meaning containing at least - five specific ingredients.”); *In re Baxter*, 656 F.2d 679, 686-87, 210 USPQ 795, 802-03 (CCPA 1981) (“As long as one of the monomers in the reaction is propylene, any other monomer may be present, because the term ‘comprises’ permits the *inclusion* of other steps, elements, or materials.”)

In re Nomiya, 509 F.2d 566, 574, 184 USPQ 607, 613 (CCPA 1975). Therefore, we are of the view that one of ordinary skill in this art would have considered other alternatives to address the problem of inhibiting biological fouling of irrigation systems.

We have carefully considered the teachings of Alexander and find ourselves in agreement with the examiner (answer, pages 5-6) that one of ordinary skill would have found in this reference the teaching that a zinc salt, such as zinc chloride and zinc sulfate, can be used in “an effective amount” to disinfect sludge from a bio-oxidation facility by destroying bacteria therein (e.g., col. 1, lines 15-17, 29-33 and 62-64, and col. 2, lines 1-5), wherein the effective amount can be determined by one of ordinary skill in the art for the sludge stream to be treated (e.g., col. 2, lines 6-8 and 25-31).³ Indeed, it would have been apparent to this person that the destruction of bacteria in the sludge is an objective for the application of the zinc salt separate and apart from the further objective of facilitating flocculation of the sludge by adding a base to precipitate zinc hydroxide, and particularly since the reference does not teach that this salt must be applied in the presence of a base in order to meet the first objective (e.g., col. 1, lines 37-43 and 44-51, and col. 2, lines 9-24). We find that one of ordinary skill in this art would have reasonably inferred from Alexander that the amount of zinc salt to use for the sole objective of destroying bacteria can be determined by routine experimentation, and indeed, would have recognized that the zinc salt can be mixed with water prior to mixing with the sludge and the biomass contained therein (e.g., col. 1, lines 62-64, and col. 2, lines 6-8).

Based on this evidence, we conclude that, *prima facie*, one of ordinary skill in this art would have found in the known problem of biological fouling of irrigation systems and the teachings of Alexander, that a zinc salt, such as zinc chloride and zinc sulfate, would destroy bacteria in an aqueous medium, the reasonable suggestion that such zinc salts would be expected to successfully inhibit biological fouling of irrigation systems caused by bacteria when an effective amount thereof based on the particular application is mixed with the irrigation water. See *In re Dow Chemical Co.*, 837 F.2d 469,

³ It is well settled that in considering the effect of a reference, we must consider the specific teachings thereof and the inferences one of ordinary skill in this art would reasonably be expected to draw therefrom, see *In re Fritch*, 972 F.2d 1260, 1264-65, 23 USPQ2d 1780, 1782-83 (Fed. Cir. 1992);

473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988) (“Both the suggestion and the expectation of success must be founded in the prior art, not in the applicant’s disclosure.”); *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981)(“The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.”); *see also In re O’Farrell*, 853 F.2d 894, 903-04, 7 USPQ2d 1673, 1680-81 (Fed. Cir. 1988) (“Obviousness does not require absolute predictability of success. . . . There is always at least a possibility of unexpected results, that would then provide an objective basis for showing that the invention, although apparently obvious, was in law nonobvious. [Citations omitted.] For obviousness under § 103, all that is required is a reasonable expectation of success. [Citations omitted.]”).

Accordingly, in view of the *prima facie* case of obviousness thus made out with respect to appealed claims 1 through 4 and 9 through 12, the burden of going forward has shifted to appellants to submit argument and/or evidence in rebuttal. *See generally, In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984).

We have again carefully evaluated all of the evidence of obviousness and nonobviousness based on the record as a whole, giving due consideration to the weight of appellants’ arguments of record, including the declaration of Appellant Iverson,⁴ as they pertain to the new ground of rejection which we have entered above. Appellants frame the issue in this appeal as whether Alexander is analogous prior art (brief, page 2), which, of course, carries with it the issue of the teachings and inferences that one of ordinary skill in this art would have been reasonably expected to draw from the disclosure of this reference. We have again considered our analysis of Alexander above in light of appellants’ contention that the use of zinc salt is disclosed in the reference “only with a particular control of the pH of the sludge mixture” (brief, e.g., page 4; reply brief, page 4) and that the reference thus teaches away from the claimed invention because it “discloses no

In re Preda, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968), presuming skill on the part of this person. *In re Sovish*, 769 F.2d 738, 743, 226 USPQ 771, 774 (Fed. Cir. 1985).

⁴ The declaration was submitted on November 16, 1995 (Paper No. 5).

beneficial use of a zinc compound by itself’ (*id.*, pages 7-8; reply brief, pages 2-3). However, we remain in agreement with the examiner that one of ordinary skill in this art would have reasonably recognized from this reference that one of the listed zinc salts can be used by itself, that is, without the addition of base, to destroy bacteria in an aqueous system, as we find no express teaching or reasonable inference that the addition of base is necessary to the destruction of bacteria by the zinc salt.⁵ On this basis, we must also agree with the examiner that these teachings of Alexander are reasonably pertinent to the known problem of biological fouling of irrigation water which appellants address, because this reference “logically would have commended itself to an inventor’s attention in considering” this problem as the removal of the effects of bacteria in an aqueous system is an objective of Alexander. *In re Clay*, 966 F.2d 656, 659-60, 23 USPQ2d 1058, 1060-61 (Fed. Cir. 1992). We have carefully considered the testimony of Appellant Iverson in his declaration and agree with the examiner that this evidence establishes only that the practice of the invention with an admixture of “active zinc with irrigation water” resulted in no “noticeable formation of precipitation or clogging of the pipes or nozzles in the irrigation systems” (declaration, page 2; brief, page 14; answer, page 7), which evidence that the claimed invention will function as disclosed in the specification does not amount to evidence that would patentably distinguish the claimed invention from the combination of the known problem and the pertinent teachings of Alexander.

Accordingly, having reconsidered the evidence of record in light of appellants’ arguments of record as they pertain to the new ground of rejection which we have entered above, we remain of the opinion that the claimed invention encompassed by appealed claims 1 through 4 and

⁵ See *In re Gurley*, 27 F.3d 551, 552-53, 31 USPQ2d 1130, 1131-32 (Fed. Cir. 1994) (“A reference may be said to teach away when a person of ordinary skill, upon reading the reference would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant. The degree of teaching away will of course depend on the particular facts; in general, a reference will teach away if it suggests that the line of development flowing from the reference’s disclosure is unlikely to be productive of the result sought by the applicant. [Citations omitted.]”).

9 through 12 are *prima facie* obvious over the combination of the known problem and the pertinent teachings of Alexander. Thus, the burden of going forward with respect to this ground of rejection remains with appellants. *See Piasecki, supra*.

We have not extended the new ground of rejection to include appealed claims 5 through 8 because there is no evidence or explanation in the record which pertains to an active zinc chelated with 1-hydroxy ethane 1,1-diphosphonic acid (HEDPA) that is specified in claim 5, on which claims 6 through 8 directly or ultimately depend. We fail to find in the examiner's answer any response to appellants' contentions that Geiger discloses "a water soluble zinc compound and HEDPA . . . only for the purpose of treating cooling water" (brief, pages 12-13). We do find that zinc chelated with HEDPA is not among the "water-soluble zinc compounds" listed at page 5 of this reference, which further discloses at page 6 that organic phosphonates, such as HEDPA, are used to form orthophosphate *in situ*. Thus, we find no evidence which establishes that one of ordinary skill in this art would have recognized that zinc chelated with HEDPA is useful in the process of Alexander even in view of the disclosure in this reference that "[o]rganic zinc salts may also be used" (col. 2, lines 1-2 and 5). Accordingly, we find no evidence in the record which would support a *prima facie* case of obviousness with respect to the claimed method encompassed by appealed claims 5 through 8.

The examiner's decision is reversed.

This decision contains a new ground of rejection pursuant to 37 CFR § 1.196(b)(amended effective Dec. 1, 1997, by final rule notice, 62 Fed. Reg. 53,131, 53,197 (Oct. 10, 1997), 1203 Off. Gaz. Pat. & Trademark Office 63, 122 (Oct. 21, 1997)). 37 CFR § 1.196(b) provides that, "A new ground of rejection shall not be considered final for purposes of judicial review."

37 CFR § 1.196(b) also provides that the appellant, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of proceedings (§ 1.197(c)) as to the rejected claims:

- (1) Submit an appropriate amendment of the claims so rejected or a showing of facts relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the application will be remanded to the examiner. . . .
- (2) Request that the application be reheard under § 1.197(b) by the Board of Patent Appeals and Interferences upon the same record. . . .

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

REVERSED

37 CFR § 1.196(b)

CHARLES F. WARREN)	
Administrative Patent Judge)	
)	
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THOMAS A. WALTZ)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
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