

Appeal No. 1997-0330
Application 08/493,758

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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(2) is not binding precedent of the Board.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. 12

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte DIETER GUHL,
and FRANK HONSELMANN

Appeal No. 1997-0330
Application No. 08/493,758¹

ON BRIEF

Before WINTERS, WILLIAM F. SMITH, and LORIN, Administrative Patent Judges.

LORIN, Administrative Patent Judge.

¹ Application for patent filed June 22, 1995.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. ' 134 from the final rejection of claims 1 and 3, all the claims pending in the application. On consideration of the record, we affirm the '103 rejection of claim 1, reverse the '102 rejection of claim 1, reverse the '102 and '103 rejections of claim 3, and, pursuant to 37 C.F.R. ' 1.196(b), apply a new '103 rejection of claims 1 and 3.

Representative Claim

1. An acidic electrolyte for dip-tin-plating of aluminum alloys, containing tin salts, surfactants and additives yielding fluoride ions, comprising, as additives yielding fluoride, fluorine complexes having an optimum effective fluoride content that corresponds to the maximum solubility of the additives and wherein the fluoride complex is present in concentrations exceeding its solubility product.

The reference relied upon by the examiner is:

Kirman et al. (Kirman) 4,170,525 Oct. 9, 1979

The rejection is:

Claims 1 and 3 are rejected under 35 U.S.C. ' 102(b) as anticipated by or, in the alternative, under 35 U.S.C.

' 103 as being obvious over Kirman.

I. Examiner's rejection.

The rejection of claims 1 and 3 is presented under alternative grounds of anticipation under '102 and obviousness under '103. To reach the merits of each ground, we will treat them separately.

Anticipation of Claim 1

Representative claim 1 is directed to an electrolyte composition comprising three components:

tin salts;

surfactants; and,

additives yielding fluoride ions.

There is no dispute that each of these three components are identically taught in Kirman: col. 5, lines 43-45; col. 5, line 56; and, col. 5, lines 30-42, respectively.

The issue is whether Kirman identically teaches the remaining limitation in representative claim 1: that the fluoride ion-yielding additives of the electrolyte

comprise "fluorine complexes having an optimum effective fluoride content that corresponds to the maximum solubility of the additives and wherein the fluoride complex is present in concentrations exceeding its solubility product."

The examiner argues that Kirman teaches an electrolyte with the HBF_4 fluoride complex at a concentration to give an excess of available F^- ions. The argument appears to be that if Kirman teaches providing excess F^- ions, this necessarily teaches providing the complex in a concentration exceeding its solubility product. We disagree. The test for anticipation is not whether the prior art is broad enough to suggest a claimed limitation. For a prior art reference to anticipate in terms of 35 U.S.C. ' 102, every element of the claimed invention must be identically shown in the single reference, @ In re Bond, 910 F.2d 831, 832, 15 USPQ2d 1566, 1567 (Fed. Cir. 1990). Here, Kirman does not show a fluoride complex concentration in excess of its "solubility product" and therefore Kirman does not

identically show the claimed electrolyte. Since there is no identity, we reverse the rejection of claim 1 for anticipation under '102.

Obviousness of Claim 1

The issue is whether Kirman renders obvious the electrolyte of representative claim 1 wherein the fluoride ion-yielding additives of the electrolyte comprise "fluorine complexes having an optimum effective fluoride content that corresponds to the maximum solubility of the additives and wherein the fluoride complex is present in concentrations exceeding its solubility product." According to the specification (p. 3), such a concentration is selected to obtain "a relatively, constant active substance [i.e., fluoride complex]" in the electrolyte. In other words, the fluoride complex is in the electrolyte at a concentration that exceeds the amount needed to maintain the plating process. According to appellants (brief, p. 10), Kirman does not disclose this excess level of fluoride complex and contend that by requiring the fluoride complex to be

present in concentrations exceeding its solubility product, the claimed invention patentably distinguishes over Kirman.

From our review of Kirman, we do not find that Kirman places any limitation on the concentration of fluoride complex in the plating bath. When discussing the fluoride component in the plating bath, Kirman merely requires a source of supply, leaving open the amount. See col. 5, lines 30-42. Nothing critical is indicated for the fluoride concentration. Kirman places limitations on, for example, the concentration of stannous ions (col. 3, lines 3-20) but suggests no upper limit for the fluoride ions. Although Kirman (col. 5) does disclose preferable ranges for fluoride ion concentration, depending on the type of tin alloy being deposited, higher concentrations are not precluded. In fact, with respect to coating pure tin, Kirman (col. 4, lines 67-68) specifically states that the plating bath can contain "greater than 1.0 g/l fluoride ions, or fluoride containing ions, or mixtures thereof".

Kirman does not place any restrictions on the fluoride concentration. Therefore, although Kirman does not expressly recite a fluoride complex concentration in excess of its "solubility product", given that this is an amount of fluoride in excess of what is needed and that Kirman suggests using any amount, it reasonably suggests to one of ordinary skill in this art to employ a fluoride complex in Kirman's electrolyte bath at any concentration, including that claimed, in order to achieve similar tin-plating results. There is therefore a prima facie case of obviousness for the claimed invention over Kirman's disclosed electrolyte.

Having established a prima facie case of obviousness, the burden now shifts to appellants to come forward with objective evidence to rebut the prima facie case. See In re De Blauwe, 736 F.2d 699, 706, 222 USPQ 191, 197 (Fed. Cir. 1984), citing In re Rinehart, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976).

In order for a showing of "unexpected results" to be probative evidence of non-obviousness, it falls upon the applicant to at least establish: (1) that there actually is a difference between the results obtained

through the claimed invention and those of the prior art, In re Klosak, 59 CCPA 862, 455 F.2d 1077, 173 USPQ 14 (1972); and (2) that the difference actually obtained would not have been expected by one skilled in the art at the time of invention, *Id.*; In re D'Ancicco, 58 CCPA 1057, 439 F.2d 1244, 169 USPQ 303 (1971).

In re Freeman, 177 USPQ 139, 143 (CCPA 1973).

Appellants (brief, p. 10²) argue that there is a difference between the claimed electrolyte and that of the cited art and direct our attention to three examples on pages 4 and 5 of the specification. Considering that the issue is whether there is an unexpected result associated with electrolytes having a fluoride complex in concentrations exceeding, as opposed to not exceeding, its solubility product, an appropriate showing of unexpected results would have been a side-by-side experiment comparing two electrolytes, each containing the same fluoride complex but in concentrations above and below its solubility product and under essentially identical conditions. Here instead, each of appellants' three examples involve a

² "It should be noted that in each example relating to the present invention, the electrolyte, Na₂SiF₆ or KBF₄, is present in an amount exceeding [appellants= emphasis] its solubility product. E.g., Example 1, Na₂SiF₆ has the solubility product of 7.5 g/l but it is present in a quantity of 8 g/l.

Whereas, in the comparison Example, based on the cited art, HBF₄ is present in an amount 3.5 g/l which is below [appellants= emphasis] its solubility of 300 g/l at the cited temperature. Thus, once these F ions are consumed, there is no way, a replenishment is possible based on the teachings of the cited art. The presently pending claim 1 clearly has this limitation that in the present case, fluorine complex must be present in concentration exceeding its solubility product." (Brief, p. 10).

different fluoride complex: Na_2SiF_6 , KBF_4 , and HBF_4 ; and are conducted under different conditions. Na_2SiF_6 and KBF_4 are dissolved in the electrolyte at 20° and 30°C while HBF_4 is dissolved at 30°C . Na_2SiF_6 and KBF_4 are present in concentrations above their solubility product while HBF_4 is present below its solubility product. Based on the information from these three examples, it is impossible to determine if, under uniform conditions, Na_2SiF_6 and KBF_4 would perform any differently if present below their solubility product or, with respect to HBF_4 , above its solubility product. As a result, we cannot determine if an actual difference exists for the claimed electrolyte as opposed to electrolytes with fluoride concentrations at any other level.

Furthermore the "Comparison Example", which appellants argue (brief, p. 10) is based on the cited art, employs HBF_4 at a concentration approaching the minimum level (i.e., 3.5 g/L) disclosed in Kirman. Since, as the examiner has indicated (examiner's answer, p. 5), Kirman teaches much higher concentrations, objective evidence that persuasively demonstrates differences between the claimed and Kirman electrolytes would require an evaluation of the closest prior art. Here that would be Kirman electrolytes with HBF_4 concentrations of at least 200 g/L (Kirman, col. 5).

Since a valid comparative evaluation was not

conducted, appellants have not established unexpected results for the claimed electrolyte to overcome the prima facie case. We therefore affirm the '103 rejection of claim 1 over Kirman.

Anticipation and Obviousness of Claim 3

We reverse the '102 rejection as to claim 3 because this claim requires that the fluoride complexes of claim 1 be Na_2SiF_6 or KBF_4 . Kirman does not disclose these complexes and therefore lacks the requisite identity for anticipating the claim.

There is also no prima facie case of obviousness under '103 because there is no suggestion in Kirman, and no other cited art, that would guide one of ordinary skill to choose these types of complex salts. We agree with appellants (brief, p.11, first paragraph) that Kirman teaches acids as fluoride ion sources and not salts and does not suggest employing one over the other. While this argument does not bear on claim 1 where both acids and salts are covered, claim 3 is specifically directed to salts. Examiner bears the burden of showing

that, given the teachings of Kirman, one of ordinary skill would have selected the two recited salts. This has not been done and we therefore reverse this rejection.

II. New Ground of Rejection under 37 C.F.R. ' 1.196(b)

Under the provisions of 37 C.F.R. ' 1.196(b), we make the following new ground of rejection.

Obviousness

Claims 1 and 3 are rejected under 35 U.S.C. ' 103 as being unpatentable over Kirman in view of Beckwith [U.S. 3,769,182].

For the reasons set forth supra, Kirman renders prima facie obvious the claimed acidic electrolyte composition comprising tin salts, surfactants and fluoride complexes at the claimed concentration. Kirman however does not teach employing fluoride salts in the plating bath as prescribed by claim 3. Kirman (col. 5, lines 30-42) teaches only acids as a source for the fluoride ions.

Beckwith also teaches an acidic plating bath for electro-depositing tin-containing salts (Example 2, col. 9), surfactants (col. 2, line 40), and a fluoride-containing electrolyte. Beckwith's source of fluoride is, however, not limited to acids. Salts (col. 4, lines 16-38), including "complex salts" (col. 4, line 25) of fluoborates (i.e., BF_4^-) and fluosilicates (i.e., SiF_6^{-2}), may also be used. Beckwith suggests that using these types of complex salts is an equivalent alternative to using the acid counterpart. Given this suggestion, to one with ordinary skill in the art with Beckwith in hand, it would have been prima facie obvious to substitute the acid (e.g., HBF_4) used in Kirman with a complex salt, as claim 3 prescribes, and achieve the same electrolytic result.

This decision contains a new ground of rejection pursuant to 37 C.F.R. ' 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 C.F.R. ' 1.196(b) provides that A[a] new ground of rejection shall not be considered final for purposes of judicial review.@

37 C.F.R. ' 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 (37 C.F.R. ' 1.197(c)) as to the rejected claims:

- 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

C.F.R.

' 1.136(a).

AFFIRMED-IN-PART - 37 C.F.R. ' 1.196(b)

	SHERMAN D. WINTERS)	
	Administrative Patent Judge)	
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PATENT)	
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