

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte MARIO LUSI COSTA,
CHUNMIN PU, and EDWARD J. BECHBERGER

Appeal No. 2007-1227
Application No. 10/416,211

ON BRIEF

Before ADAMS, LINCK and LEBOVITZ, Administrative Patent Judges.

ADAMS, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on the appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1 and 3, which are all the claims pending in the application.

Claim 1 is illustrative of the subject matter on appeal and is reproduced below:

1. A continuous process for the production of chlorine dioxide, which comprises:

continuously reducing using hydrogen peroxide chlorate ions in an aqueous acid reaction medium which is maintained at its boiling point under a subatmospheric pressure while maintaining in the reaction medium a residual chlorine concentration of about 0.1 to about 0.5 g/l while having no residual hydrogen peroxide concentration in said reaction medium.

The evidence relied upon by the examiner is:

Winters et al. (Winters)

WO 93/25470

Dec. 23, 1993

GROUNDS OF REJECTION

Claims 1 and 3 stand rejected under 35 U.S.C. § 102 as anticipated by Winters.

Claims 1 and 3 stand rejected under 35 U.S.C. § 103 as being unpatentable over Winters.

We affirm the rejection under 35 U.S.C. § 102 and affirm the rejection under 35 U.S.C. § 103.

DISCUSSION

Anticipation:

Claims 1 and 3 stand rejected under 35 U.S.C. § 102 as anticipated by Winters.

According to the examiner (Answer, page 4), Winters “discloses a method of producing chlorine dioxide, which comprises reacting chloric acid^[1] with hydrogen peroxide as a reducing agent in such proportions that chlorine dioxide is produced (note claim 1).” More particularly, Winters teaches a continuous method for the production of chlorine dioxide which comprises continuously reducing chlorate ions with hydrogen peroxide in an aqueous acid medium which

¹ According to appellants’ specification (page 3), chlorate ion is “generally provided in the form of chloric acid . . .”

is maintained at its boiling point under subatmospheric pressure. Winters, pages 6-7.

The examiner finds (Answer, page 4) that the equation on page 3 of Winters illustrates that 2 moles of chloric acid react with one mole of hydrogen peroxide to form 2 moles of chlorine dioxide. In addition, the examiner finds (Answer, bridging paragraph, pages 4-5) that Winters "discloses that hydrogen peroxide is preferably added in an amount from about 0.4 to about 0.7 moles per mole of chlorine dioxide produced (note page 7, lines 7-9)." More specifically, Winters provides the following balanced chemical equation for the reaction of hydrogen peroxide with chloric acid to produce chlorine dioxide:



Winters, page 3. As can be seen from this balanced equation the ratio of hydrogen peroxide to chlorine dioxide produced is 1:2. Thus, when the ratio of hydrogen peroxide to chlorine dioxide produced in the reaction is 1:2 there will be no residual hydrogen peroxide left in the reaction medium upon completion. For clarity, note the absence of hydrogen peroxide on the right hand side of the equation. This equation also sets the minimum amount of chloric acid in the reaction as equal to the amount of chlorine dioxide produced.

Thus, the only remaining limitation in appellants' claim 1 that is not yet accounted for is a residual chlorine concentration of about 0.1 to about 0.5 g/l. In this regard, we note that the examiner finds (Answer, page 5) that Winters teaches that an addition of small amount of chloride ions can be appropriate, preferably in the form of alkali metal chloride, so as to maintain the concentration thereof in the reactor within the range from 0.001 and up to 0.8 moles per litre (note page 7, lines 15-19).

Since for every mole of alkali metal chloride (e.g. NaCl), there are 35.5 g of chlorine, thus, there would be .[0]355 (= 0.001 * 35.5) - 28 (= 0.8 * 35.5) g of chlorine per litre.

Thus, Winters teaches a genus (0.0355 – 28 g/l) that encompasses appellants' claimed species (about 0.1 – about 0.5 g/l). It is, however, well established that the disclosure of a genus in the prior art is not necessarily a disclosure of every species that is a member of that genus. See, e.g., In re Baird, 16 F.3d 380, 382, 29 USPQ2d 1550, 1552 (Fed. Cir. 1994). On the other hand, a very small genus can be a disclosure of each species within the genus. In re Petering, 301 F.2d 676, 682, 133 USPQ 275, 280 (CCPA 1962). In our opinion, however, Winters' disclosure of chlorine concentration of 0.0355 – 28 g/l is not so small a genus to anticipate appellants' claimed range of about 0.1 to about 0.5 g/l of residual chlorine. Here, the prior art, Winters discloses a range which is broader than and fully encompasses the specific range claimed by appellants. Given the considerable difference between the claimed range and the prior art range we find that Winters fails to describe the range with sufficient specificity to anticipate appellants' claimed range. Accordingly, we reverse the rejection of claims 1 and 3 under 35 U.S.C. § 102 as anticipated by Winters.

Obviousness:

Claims 1 and 3 stand rejected under 35 U.S.C. § 103 as being unpatentable over Winters. Appellants do not separately group or argue their claims. Therefore, the claims will stand or fall together. 37 CFR

§ 41.37(c)(1)(vii) (July 2006). Since the claims stand or fall together we select claim 1 as representative of the group. Claim 3 will stand or fall together with claim 1.

The examiner relies on Winters as set forth above. Answer, page 6.
According to the examiner (id.),

[w]ith respect to the encompassing . . . ranges previously discussed, the subject matter as a whole would have been obvious to one of ordinary skill in the art at the time of invention to select the portion of the prior art's range which is within the range of the [a]ppellants' claims because it has been held *prima facie* . . . [obvious] to select a value in a known range by optimization for the results.

We agree.

Effective volumes and concentrations are result effective variables, and it would have been obvious to optimize those parameters as a matter of routine experimentation. See In re Boesch, 617 F.2d 272, 276, 205 USPQ 215, 235 (CCPA 1980) (noting that the determination of the optimum values of result effective variables is ordinarily within the skill of the art); see also In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955) (“where general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.”).

Accordingly, we disagree with appellants' intimation (Brief, page 23) that a person of ordinary skill in the art would not have been motivated to optimize the concentration of chloride ions in the reaction mixture. We are also not persuaded by appellants' assertions regarding the “foaming problem of the prior art.” As set

forth in In re Woodruff, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990), alteration original,

The law is replete with cases in which the difference between the claimed invention and the prior art is some range or other variable within the claims. See, e.g., Gardner v. TEC Sys., Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir.), cert. Denied, 469 U.S. 830 [225 USPQ 232] (1984); In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980); In re Ornitz, 351 F.2d 1013, 147 USPQ 283 (CCPA 1965); In re Aller, 220 F.2d 454, 105 USPQ 233 (CCPA 1955). These cases have consistently held that in such a situation, the applicant must show that the particular range is critical, generally by showing that the claimed range achieves unexpected results relative to the prior art range.

On this record, we find no comparison of appellants' claimed invention to Winters, the closest prior art.

Accordingly, we affirm the rejection of claim 1 under 35 U.S.C. § 103 as being unpatentable over Winters. Claim 3 falls together with claim 1.

AFFIRMED

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Administrative Patent Judge)
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