

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 30

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JEAN-LOUIS G. GHEYSSENS, WILLIAM J. WELLS, III
and RICHARD E. WOODLING

Appeal No. 96-2808
Application 08/102,708¹

ON BRIEF

Before WEIFFENBACH, ELLIS and LIEBERMAN, *Administrative Patent Judges*.

WEIFFENBACH, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 21-26, 29-31, 38 and 39, which are all of the claims remaining in the application. We affirm-in-part and we enter a new ground of rejection pursuant to the provisions of 37 CFR § 1.196(b).

¹ Application for patent filed August 5, 1993. According to appellants, the application is a continuation of Application 07/832,745, filed February 7, 1992, now abandoned.

The Claimed Subject Matter

The claims on appeal are directed to an ether and gasoline composition and the method for producing the same. Claims 21, 26, 31, and 39 are representative of the claimed subject matter and read as follows:

21. A method for producing a mixed ether and gasoline containing composition to form an oxygenated fuel mixture comprising the steps of reacting a mixture containing C₁-C₈ alcohols with an alkene, to form an alkyl-t-alkyl mixed ether composition; and mixing said ether composition with gasoline.

26. The method of claim 21 comprising the additional step of reacting a hydrocarbon containing source stream to produce said alcohol mixture.

31. A mixed ether and gasoline containing composition formed by the method of: reacting a hydrocarbon containing source stream to produce a mixture comprising C₁-C₈ alcohols; reacting said mixture with an alkene selected from the group consisting of isobutylene, isoamylene, isoprene, cyclopentadiene and mixtures thereof, to form a mixed ether reaction product; and mixing said reaction product with gasoline.^[2]

39. The mixed ether and gasoline composition of claim 31 wherein said mixed ether reaction product is mixed with gasoline to form a 15% (v/v) mixture based on said gasoline.

²Claim 31 as it appears in this decision is copied from appellants' appendix to the brief. We note that claim 31 as it was amended in amendment "F" (paper no. 21) after the first Office action on the merits includes an extra closed bracket (]) in line 2 of the claim between "an" and "oxygenated." A second closed bracket appears in line 4 after "product." The examiner did not question the subject matter set forth of claim 31 as it appears in the appendix of appellants' brief and indicated that it was correct (answer: p. 2). Thus, we conclude that the inclusion of the extra closed bracket as per the amendment was inadvertent. However, in the event of further prosecution of claim 31 in this application, appellants should take corrective action to remedy this matter to eliminate any question of ambiguity with respect to how appellants intended to amend claim 31 after the first Office action.

References of Record

The following references of record are relied upon by the examiner as evidence of obviousness:

Buc	2,046,243	Jun. 30, 1936
Leum et al. (Leum)	2,480,940	Sep. 6, 1949
Bruderreck et al. (Bruderreck)	4,468,233	Aug. 28, 1984

The Rejections³

Claims 21-26, 29-31, 38 and 39 stand rejected under 35 U.S.C. § 103 as being unpatentable over Bruderreck in view of Leum, appellants' own admission of the state of the art, and Buc.

Claim 26 stands rejected under 35 U.S.C. § 112, first paragraph, in that the disclosure is non-enabling.

Opinion

We have carefully considered the respective positions advanced by appellants and the examiner. For the reasons set forth below, we will affirm the examiner's rejection of claims 31 and 39, but we reverse the examiner's rejection of claims 21-26, 29-30 and 38 under 35 U.S.C. § 103. We also reverse the examiner's the rejection of claim 26 under 35 U.S.C. § 112, first paragraph. Since our rationale for affirming the rejection of claims 31 and 39 under 35 U.S.C. § 103 over Bruderreck in view of Leum, appellants' own admission of the state of the art, and Buc is different from that expressed by the examiner, we denominate our affirmance as a new rejection pursuant to the provisions of 37 CFR § 1.196(b).

³The final Office action included a rejection of claims 21, 31, 38 and 39 under 35 U.S.C. § 112, second paragraph. This rejection has been withdrawn by the examiner (answer: p. 2) and is not before us for consideration.

REJECTION UNDER 35 U.S.C. § 103

The examiner rejected claims 21-26, 29-31, 38 and 39 under 35 U.S.C. § 103 as being unpatentable over Bruderreck in view of Leum, appellants' admission of the state of the art, and Buc. The admission referred to by the examiner appears in the specification in the paragraph bridging pages 5 and 6 and at page 7, lines 24-32 and reads as follows:

The method of the invention comprises etherifying a thermochemical alkanol mixture of at least C₁-C₄ alcohols with alkenes to produce the mixed ether composition of the invention. The alkanol mixture can be synthesized from refinery streams such as still bottoms, which normally require substantial amounts of processing to achieve a valuable product, or which must be disposed of as hazardous waste. The method eliminates major equipment needs and operating costs associated with purchasing, storage of intermediates, waste management and refinery compliance with the CAA [Clean Air Act] and other applicable regulations.

* * *

In order to produce a multiple boiling point ether gasoline component of the present invention[,] a mixed alcohol is reacted with a stream of alkenes, preferably olefins or dienes. The mixed alcohol component can be produced by Fisher-Tropsch [sic, Fisher-Tropsch] synthesis or via Syn-Gas techniques from hydrocarbon sources such as natural gas, light naphthas or even crude oil bottoms and residues, thereby providing the refiner with additional benefits.

From this disclosure, the examiner made a finding that "appellant makes [sic, appellants make] admission of record that Fisher-Tropsch [sic, Fisher-Tropsch], synthesis or via Syn Gas techniques are old well-known techniques conventionally used to derive alcohol mixtures from hydrocarbons.

Appellants do not dispute this finding, but argue that they have provided a new fuel formulation "which takes advantage of the already existing capacity of the industry to make mixed alcohols (e.g. via the syn-gas route) and using those mixed alcohols as feed stock for making that new fuel" (brief: p. 10).

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Appellants argue that the references as combined by the examiner do not establish a *prima facie* case of obviousness because “these references fail to teach or suggest ... the combination of taking a specified mixed alcohol ... reaction stream, forming a mixed ether reaction product from that stream and blending that mixed ether product with gasoline ...” (brief: p. 10). Appellants further argue that the combination of Bruderreck, Buc and Leum lacks “any suggestion that the process of the [Leum] patent be joined with the processes described in the [Bruderreck] patent, and then modified to specifically use a C₁-C₈ alcohol containing feed stream” (brief: p. 10). Appellants also argue that Leum never mentions mixing his ethers with gasoline and that Bruderreck and Buc “do not mention a step of using a mixed alcohol stream to form the mixed ethers” (brief: p. 10). Appellants conclude that “[s]ince each of appellants’ claims requires such a mixed alcohol stream used to form a mixed ether product which is then blended with gasoline, no case of obviousness is made out” (brief: p. 10).

Upon careful review of the record, we must agree with appellants. The examiner has not satisfied her burden of establishing a *prima facie* case of obviousness with respect to claims 21-26, 29, 30 and 38 by showing that some objective teaching or suggestion in the prior art taken as a whole or that knowledge generally available to a person of ordinary skill in the art would have led that person to combine the relevant teachings of the applied references in the proposed manner to arrive at the claimed invention without recourse to the teachings in appellant’s disclosure. *See In re Dow Chemical*, 837 F.2d 469, 473, 5 USPQ2d 1529, 1531-1532 (Fed. Cir. 1988); *In re Fine*, 837 F.2d 1071, 1074-1076, 5 USPQ2d 1596, 1598-1600 (Fed. Cir. 1988).

Buc discloses blending a branched ether such as isopropyl ether, t-butyl ether, methyl-t-butyl ether or methyl-t-amyl ether with gasoline or motor fuel for the purpose of reducing knock and increasing octane number (col. 1, lines 6-10 and 34-47). Bruderreck discloses blending a mixture of branched ethers (methyl-t-butyl ether, isopropyl-t-butyl ether and sec-butyl-t-butyl ether) with motor fuel to, *inter alia*, improve octane number (abstract; col. 2, lines 38-57; col. 4, lines 24-42). Bruderreck states that the "use of ether ... mixtures is an improvement over the use of a single ether" (col. 3, lines 35-37). Leum discloses a method of preparing a mixture of branched ethers by contacting one or more C₁-C₁₂ primary or secondary alcohols such as methanol, ethanol and isopropanol with one or more C₄-C₁₆ branched olefins such as isobutylene and isoamylene (col. 1, lines 10-49; col. 4, lines 5-9; table in col. 3). However, Leum does not teach or suggest any use for his ether product. The examiner concluded that "[h]aving the prior art before him the artisan in the art would have been motivated to substitute Leum ether mixture for Bruderreck ether mixture with the reasonable expectation [that] the ether mixture will exhibit the same or similar properties because Leum ether mixture encompasses Bruderreck ether mixture" (answer: paragraph bridging pp. 4-5).

We find that the examiner has not established a *prima facie* case. Bruddereck discloses blending three specific alkyl-t-butyl ethers together to form a mixture which is then mixed with motor fuel. We find that there is no teaching or suggestion in the art of record which would have motivated a person having ordinary skill in the art to substitute Leum's particular method for preparing ether mixtures for Bruderreck's method to arrive at appellants' method set forth in claims 21-26, 29 and 30. The examiner appears to rely

on the fact that t-butyl and t-amyl ethers are known fuel additives as the motivating factor. However, we do not find this fact, in and of itself, sufficient evidence which would have motivated one skilled in the art to modify Bruderreck as suggested by the examiner because we find no evidence or teaching in the prior art which would suggest the desirability of making such a modification. The mere fact that the prior art could be modified does not make such a modification obvious unless the prior art suggests the desirability for using Leum's method in place of Bruderreck's method. *In re Gordon*, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). On the record before us, the suggestion to substitute the method of preparing the ether mixture in accordance with the teachings of Leum for the blending method disclosed by Bruderreck could have only come from appellants' disclosure. Accordingly, the examiner's rejection of claims 21-26, 29 and 30 over the applied prior art is reversed.

As for claims 31, 38 and 39, these claims are directed to a product comprising a mixed ether and gasoline. Because the products recited in these claims are recited in terms of the process for making them, the claims are in product-by-process form. The patentability of such claimed subject matter is determined based on the product itself, and not on the process of making it. *See In re Thorpe*, 777 F.2d 695, 697, 227 USPQ 964, 966 (Fed. Cir. 1985) ("If the product in a product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior art product was made by a different process."). Whether a rejection is under 35 U.S.C. § 102 or § 103, when appellants' product and that of the prior art appear to be identical or substantially identical, the burden shifts to appellant to provide evidence that the prior art product does not necessarily or inherently possess the relied

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upon characteristics of appellant*s claimed product. *See In re Fitzgerald*, 619 F.2d 67, 70, 205 USPQ 594, 596 (CCPA 1980); *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433-434 (CCPA 1977); *In re Fessmann*, 489 F.2d 742, 745, 180 USPQ 324, 326 (CCPA 1974). The reason for this is that the U.S. Patent and Trademark Office is not able to manufacture and compare products. *See In re Best*, 562 F.2d at 1255, 195 USPQ at 434; *In re Brown*, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972).

The product disclosed by Bruderreck is a composition comprising a mixed alkyl-t-butyl ethers and gasoline. Bruderreck's ethers have an isobutylene component and each ether in the mixture has an alkyl component having one, three or four carbon atoms (Bruderreck: col. 4, lines 26-30). This composition appears to be substantially the same composition as recited in appellants' claim 31 which sets forth a composition comprising gasoline and a mixture of C₁-C₈ alkyl- t-butyl ethers. In addition, Bruderreck discloses that the amount of the mixed ethers blended with the gasoline is preferably 10-30% by volume. This amount encompasses appellants' claimed 15% by volume as set forth in claim 39 (Bruderreck: col. 2, lines 10-13). It is well settled that a prior art range which encompasses a claimed range renders the claimed range *prima facie* obvious. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990); *In re Malagari*, 499 F.2d 1297, 1303, 182 USPQ 549, 553 (CCPA 1974). We conclude that Bruderreck alone establishes a *prima facie* case of obviousness with regard to the rejection of claims 31 and 39 under 35 U.S.C. § 103.

Having thus established a *prima facie* case of obviousness, we must look to any objective evidence of unobviousness presented by appellants. In Table 5 on page 26 of appellants' specification, a 15% by

volume of Bruderreck's B1 and B2 ether mixtures (col. 4, lines 21-42) are added to Unocal89 gasoline. Bruderreck's B1 and B2 formulations in Table 5 are labeled as "MIX1" and "MIX2," respectively. Appellants focus on the T90 and final boiling point data (brief: p. 11-12; Table 1, paper no. 19) and compare values for the data in Table 5 with the data for samples #614 and #628 in Table 3 on page 21 of the specification to show that their claimed composition is unexpectedly superior to Bruderreck's gasoline-ether mixtures. According to appellants, "[a]s discussed in the present specification, those skilled in the art are well aware that lower T90 and end boiling point numbers^[4] are highly desirable, since lower boiling points assist in minimizing the formation of key pollutants during combustion (see specification p. 22, lines 9-10)" (brief: p. 11).⁵

Bruderreck's T90 values for the "MIX1"/gasoline and "MIX2"/gasoline compositions in Table 5 are -4E and -8E, respectively. Appellants' T90 data in Table 3 for samples #614 and #628 are -3E (#628)⁶ and -11E (#614). However, we note that also in Table 3, which represent the claimed invention, samples #611 and #630 are -8E, which is the same as the value for "MIX2"/gasoline in Table 5. Also, we find that the T90 value for sample #614 is so close to the value for "MIX1"/gasoline, the difference is not

⁴In their brief, appellants use the terms "end boiling point" number and "end point" number interchangeably. In Table 1, paper no. 19, appellants use the terms "end point" number and "final boiling point" number interchangeably. For purposes of our discussion of the data, we will refer to this number as "end boiling point."

⁵While appellants refer to the terms "T90" and "end boiling point numbers" as indicators that their gasoline/ether composition is superior to the prior art compositions, we note that these terms have not been defined by appellants in their specification.

⁶In Table 1 (paper no. 19) submitted with appellants' response to the first Office action on the merits, appellants represented the T90 value for sample #628 as -13E. This is in error and should have been -3E (i.e. 339E-336E).

significant. Moreover, the T90 data for gasolines containing single ethers with alkyl components having one to five carbon atoms as set forth in appellants' Table 1 on page 13 of the specification reveals T90 values ranging from -3E [ethyl-t-butyl ether (#602) and n-propyl-t-butyl ether (#603)] to -33E [sec-butyl-t-butyl ether (#607)]. Accordingly, we find that the T90 data in Tables 1, 3 and 5 are inconclusive to show unexpected or superior results.

The same is true for the end boiling point data. Compare "MIX1" and "MIX2" in Table 5 (-12E and -8E, respectively) to samples #611 (-13E), #630 (-15E), #614 (-16E) and #629 (-17E) in Table 3. We find the numbers for the samples to be substantially similar to "MIX1"/gasoline which is closest to the claimed composition.⁷ Also compare the compositions in Table 3 which have end boiling point numbers ranging from -13E to -24E to samples #607, #608 and #609 in appellants' Table 1 (-32E, -32E, -30,E respectively) where the end boiling point number substantially exceeds the end boiling point numbers of appellants' samples #614 and #628 (-16E and -24E, respectively). Accordingly, we do find the end boiling point data to be inconclusive to establish that the claimed compositions are superior or have unexpected properties when compared to the Bruderreck's compositions.

For the foregoing reasons, Bruderreck presents a *prima facie* case of obviousness with regard to the rejection of claims 31 and 39 under 35 U.S.C. § 103. On consideration of all the evidence, the greater

⁷"MIX1" or Bruderreck's B1 formula is closest to the claimed composition because the ether mixture does not include a significant amount of alcohols in the ether mixture. "MIX2" or Bruderreck's formula B2 contains, in addition to the ethers of formula B1, 5% by volume methanol, 5% by volume isopropanol and 5% by volume sec-butanol. Appellants have not disclosed that their ether mixtures contain a significant amount of free alcohol.

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weight favors unpatentability. *In re Rijckaert*, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993); *In re Piasecki*, 745 F.2d 1468, 1471-1473, 223 USPQ 785, 787-788 (Fed. Cir. 1984); *In re Rinehart*, 531 F.2d 1048, 1051, 189 USPQ 143, 147 (CCPA 1976). Accordingly, the rejection of claims 31 and 39 is affirmed. Because our rationale for affirming the rejection of claims 31 and 39 differs from that of the examiner, we denominate our affirmance as a new rejection to afford appellants the procedural safeguards associated with 37 CFR § 1.196(b).

Claim 38 is directed to a composition comprising a mixture of 85% gasoline and 15% of an ether product which is formed by the steps of preparing a blend of C₁-C₈ alcohols and reacting the blend of alcohols with isoamylene. Claim 38 is a product-by-process claim. As discussed *supra*, the patentability of a product-by-process claim is based on the composition claimed, and not on the process of making it. Both Buc and Bruderreck disclose that it is known in the art to add a t-amyl ether to gasoline (Buc: col. 1, lines 6-52; Bruderreck: col. 1, lines 56-57). Bruderreck discloses a composition comprising 85% gasoline and 15% mixed t-butyl ethers. Leum discloses preparing an ether product by reacting one or more alcohols with a branched olefin such as isobutylene or isoamylene (col. 1, lines 10-36) which would lead one skilled in the art to conclude that a mixture of butyl or amyl ethers is formed. However, Leum fails to disclose any use for his ethers. While Bruderreck discloses that a composition of gasoline and a mixture of t-butyl ethers is known in the art, the patentee fails to suggest or teach a mixture of t-amyl ethers, even though the patentee recognizes that both t-butyl and t-amyl ethers individually can be added to gasoline. From these facts, we do not find that the prior art relied upon by the examiner, taken as a whole, would

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suggest the desirability of adding a mixture of t- amyl ethers to gasoline. The suggestion could only have come from appellants disclosure. Accordingly, we find ourselves in agreement with appellants that the examiner has failed to carry the burden of establishing a *prima facie* case of obviousness with respect to the rejection of claim 38 over the combined teachings Bruderreck, Leum and Buc. *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992); *In re Piasecki*, 745 F.2d at 1471-72, 223 USPQ at 787-88 (Fed. Cir. 1984). Therefore, the examiner's rejection of claim 38 is reversed.

REJECTION UNDER 35 U.S.C. § 112

The examiner rejected claim 26 under 35 U.S.C. § 112, first paragraph, because appellants' disclosure "is enabling only for claims limited to a hydrocarbon containing source stream from refinery stream, such as still bottoms, which normally require substantial amounts of processing to achieve a valuable product (the paragraph bridging pages 5 and 6 of the present specification) and hydrocarbon sources such as natural gas, light naphthas or even crude oil bottoms and residues (lines 24-32 of page 7 of the present specification)" (answer: p. 3).

The examiner has the initial burden of establishing a lack of enablement based upon scientific reasoning that the various hydrocarbon source streams exemplified in the present specification are not sufficient to support the breadth of the appealed claim. *See In re Strahilevitz*, 668 F.2d 1229, 1232, 212 USPQ 561, 563-64 (CCPA 1982); *In re Marzocchi*, 439 F.2d 220, 224, 169 USPQ 367, 370 (CCPA 1971). The test for determining compliance with the enablement requirement of the first paragraph of 35

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U.S.C. § 112 is whether the disclosure, as filed, is sufficiently complete to enable one of ordinary skill in the art to make and use the claimed invention without undue experimentation. *In re Scarbrough*, 500 F.2d 560, 566, 182 USPQ 298, 303 (CCPA 1974); *In re Moore*, 439 F.2d 1232, 1235, 169 USPQ 236, 238 (CCPA 1971). The Federal Circuit has held that a determination of whether a disclosure would require undue experimentation should consider (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims. *In re Wands*, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988). On this record before us, the examiner has not met her burden.

The examiner has merely stated that the hydrocarbon containing source stream is limited to particular sources. She has not established that the breadth of the claims would require undue experimentation by a person having ordinary skill in the art to practice the claimed invention. The claims are interpreted in light of the specification as it would be interpreted by one of ordinary skill in this art. *Gechter v. Davidson*, 116 F.3d 1454, 1457, 1460 n.3, 43 USPQ2d 1030, 1032, 1035 n.3 (Fed. Cir. 1997); *In re Morris*, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997); *In re Zletz*, 893 F.2d 319, 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989). We find that the portions of the specification referred to by the examiner clearly set forth examples of hydrocarbon containing source streams which would be within the scope of the objected to language. The examiner has not presented an analysis based upon scientific reasoning to show that a person having ordinary skill in the art would not be

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able to determine and identify such source streams with respect to claim 26. For the foregoing reasons, the rejection of claim 26 under 35 U.S.C. § 112, first paragraph is reversed.

Conclusion

For the foregoing reasons, the examiner's rejection of claims 21-26, 29, 30, and 38 under 35 U.S.C. § 103 is reversed as is the rejection of claim 26 under 35 U.S.C. § 112, first paragraph. The rejection of claims 31 and 39 under 35 U.S.C. § 103 is affirmed, but our affirmance is denominated as a new ground of rejection. Accordingly the decision of the examiner is affirmed-in-part.

This decision contains a new ground of rejection pursuant to 37 CFR § 1.196(b) (amended effective December 1, 1997, by final rule notice, 62 Fed. Reg. 53,131, 53,197 (October 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 appellants, 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 CFR § 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. . . .

No time period for taking any subsequent action in connection with this appeal may

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be extended under 37 CFR § 1.136(a).

AFFIRMED-IN-PART
37 CFR 1.196(b)

CAMERON WEIFFENBACH)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
JOAN ELLIS)	
Administrative Patent Judge)	APPEALS AND
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)	INTERFERENCES
)	
PAUL LIEBERMAN)	
Administrative Patent Judge)	

CW/dal

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W. Patrick Bengtsson
Limbach & Limbach
2001 Ferry Bldg.
San Francisco, CA 94111