

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(2) is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MATTHEW A. SIMPSON

Appeal No. 96-2535
Application 08/028,473¹

ON BRIEF

Before COHEN, PATE, CRAWFORD, **Administrative Patent Judges**.
PATE, **Administrative Patent Judge**.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1
through 20. These are the only claims in the application.

The claimed invention is directed to a mechanical seal
with a wear layer composed of a polycrystalline diamond film
coating. The diamond coating has two layers with the top

¹ Application for patent filed March 9, 1993.

Appeal No. 96-2535
Application 08/028,473

layer having reduced wear resistance characteristics. The independent claims on appeal, claim 1 and 14, are reproduced below to further illustrate the claimed subject matter.

1. A mechanical member adapted to have at least a portion of its surface slidably engaged as a wear surface by a mating surface, said member comprising:

a body having a wear surface, and

a coating of polycrystalline diamond film on the wear surface, the coating having a first, outer thickness region of a first material remote from the underlying body and a second, inner thickness region of a second material under the first thickness region, the second material having a morphology different from that of the first material.

14. A seal assembly for a rotating shaft, comprising:

first and second seal members having mating surfaces for mutually sliding engagement;

at least the first member mating surface having a polycrystalline diamond film coating, the coating having a surface with a reduced wear resistance.

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

Linda Plano, Ian Hayward and John Wegand, "CVD Diamond Films For Tribological Applications", Crystalline Final Report Contract No. N00014-89-C-0151 (March 30, 1990).

Appeal No. 96-2535
Application 08/028,473

Obata et al. (Obata)²
(Japanese Kokai)

2-192483

July 30, 1990

THE REJECTIONS

The following rejections are before us on appeal.

Claims 1 through 13 and 19 are rejected under 35 U.S.C. § 112, first paragraph, inasmuch as the specification does not provide descriptive support for the term "morphology."

Claims 1 through 13 and 19 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. According to the examiner, it is unclear what is meant by the term "morphology" as it is used throughout the claims on appeal. Additionally, the examiner states that the "underlying body" limitation of claim 1, line 8, lacks proper antecedent basis and the term "individual crystallites" in claims 13 and 19 lacks proper antecedent basis.

² Our understanding of this reference is by virtue of an English language translation.

Appeal No. 96-2535
Application 08/028,473

Claims 1, 2, and 7 stand rejected under 35 U.S.C. § 102(b) as anticipated by the report entitled "CVD Diamond Films For Tribological Applications", Plano et al.

Claims 1 through 20 stand rejected under 35 U.S.C. § 103 as unpatentable over Obata in view of CVD Diamond Films For Tribological Applications, Plano et al.

OPINION

We have carefully reviewed the rejections on appeal in light of the arguments of the appellant and the examiner. As a result of this review, we have reached the determination that the rejections entered by the examiner under 35 U.S.C. § 112, first and second paragraphs, cannot be sustained. Furthermore, rejections of claims 1-13 and 15-19 based on prior art cannot be sustained. However, we will sustain the rejection of claims 14 and 20 based on prior art grounds. Our reasons for this conclusion follow.

Turning to the rejection of claims 1 through 13 and 19 under 35 U.S.C. § 112, first paragraph, the examiner has stated that the specification does not provide descriptive support for the use of the claim term "morphology." Appellant argues that a polycrystalline material of any kind has a morphology as an inherent feature. Appellant has referred to the prior art, *e.g.*, the Plano reference which uses the term "morphology." Further-more, the appellant has provided a dictionary definition which is indicative of the use of morphology as the structure or form of something.

Appeal No. 96-2535
Application 08/028,473

We merely note that the appellant does not have to provide *ipsis verbis* support, *In re Lukach*, 442 F.2d 967, 969, 169 USPQ 795, 796 (CCPA 1971). The description in the specification must merely allow persons of ordinary skill in the art to recognize that the inventor invented what is now claimed. In this instance, given the use of the term "morphology" in the relevant prior art as evidenced by the Plano disclosure, it is our view that the specification clearly conveys that appellant was in possession of the subject matter of polycrystalline diamond morphologies at the time the application was filed. Consequently, the rejection of claims 1 through 13 and 19 under 35 U.S.C. § 112, first paragraph, is reversed.

The examiner has rejected claims 1 through 13 and 19 under 35 U.S.C. § 112, second paragraph, as indefinite on three separate grounds. Firstly, the examiner states that it is unclear what is meant by the term "morphology."

The test of whether a claim complies with § 112, second paragraph, is:

whether the claim language, when read by a person

Appeal No. 96-2535
Application 08/028,473

of ordinary skill in the art in light of the specification, describes a subject matter with sufficient precision that the bounds of the claimed subject matter are distinct. ***In re Merat***, 519 F.2d 1390, 1396, 186 USPQ 471, 476 (CCPA 1975).

As we noted, above, with respect to the rejection of § 112, first paragraph, the claim term "morphology" is often used and well recognized in the art of polycrystalline materials. Accordingly, when the claims on appeal refer to a claim structure requiring a certain morphology, it is our view that the metes and bounds of the claimed subject matter can be determined with sufficient precision by one of ordinary skill viewing the claimed subject matter. Accordingly, the rejection of claims 1 through 13 and 19 insofar as they are based on the presence of the term "morphology" is reversed.

Secondly, the examiner has rejected claim 1 and the claims that depend thereon for the stated reason that "the underlying body" in line 8 of claim 1 lacks proper antecedent basis. A review of the text of claim 1 denotes that claim 1, in line 4, sets out a "body" having a wear surface. In line 5, there is recited a coating of polycrystalline diamond on the wear surface of the body. As such, the reference to

Appeal No. 96-2535
Application 08/028,473

underlying body in claim 8 can be readily understood as referring to the body of line 5 which underlies the polycrystalline diamond film. Accordingly, we are of the view that the subject matter of claim 1 can be clearly understood in relation to the term "underlying body" as it appears in line 8. Consequently, the rejection of claims 1 through 13 based on the lack of antecedent basis of the term "underlying body" is reversed.

Thirdly, the examiner has rejected claims 13 and 19 under 35 U.S.C. § 112, second paragraph, for the reason that the term "individual crystallites" in claims 13 and 19 is said to lack a proper antecedent basis. Here again, we are in agreement with the appellant who states that a polycrystalline film such as is claimed in claim 1 would of necessity be composed of individual crystallites. Furthermore, we take official notice of the dictionary definition of the term "crystallite" as "a single grain in a polycrystalline medium."³ Examined in this way, it is clear that the appellant is correct in the use of the

³ Webster's Third New International Dictionary, G. & C. Merriam Co., Springfield, MA (1971).

Appeal No. 96-2535
Application 08/028,473

term "crystallite" to refer to the individual grains of the polycrystalline material. The metes and bounds of claims 13 and 19 can be readily determined by one of ordinary skill. Therefore, the rejection of these claims under 35 U.S.C. § 112, second paragraph, is reversed.

The examiner has rejected claims 1, 2 and 7 under 35 U.S.C. 102(b) as anticipated by the report entitled "CVD Diamond Films For Tribological Application", hereinafter referred to as Plano. We are in agreement with the examiner that Plano discloses throughout the report, that one type of diamond film coating is commonly referred to as the "cauliflower" type surface. We further agree with the examiner that Plano discloses that this surface has a reduced wear resistant property when compared with other morphologies having higher centerline average ranges in nanometers. See Table 5 on page 17 of Plano. However, we do not agree with the examiner's further finding of fact that the cauliflower-type surface can be considered to be an overlayer with a different morphology than the underlying cauliflower-type surface. We find that Plano contemplates a tribologic coating on a substrate with the tribologic coating of the same

Appeal No. 96-2535
Application 08/028,473

morphology throughout. Therefore, we are in agreement with the appellant that there is no suggestion in either Plano or the Obata references of using a combination of diamond film layers of different morphologies. As the appellant points out, morphology of the cauliflower surface layer disclosed in Plano is the same morphology as the underlying diamond layer. Both layers are of the same cauliflower morphology. As the appellant succinctly states, it is important to note that the cauliflower-like features are not only visible at the surface but are present also in the underlying bulk of this particular reduced wear resistance morphology diamond film. (Appeal Brief, page 12). For this reason, it is our conclusion that Plano cannot be said to have two discrete diamond layers of different morphology as required by claim 1. Accordingly, the rejection of claim 1 under 35 U.S.C. § 102(b) cannot be sustained.

Turning to the rejection under 35 U.S.C. § 103 and considering claims 1 through 13 first, we note that Obata also does not disclose the polycrystalline diamond wear surface having two distinct morphologies. Thus, Obata does not in any way overcome the shortcomings of Plano which we have

Appeal No. 96-2535
Application 08/028,473

discussed, *supra*. Therefore, the rejection of claims 1 through 13 under 35 U.S.C. § 103 is reversed, inasmuch as the examiner has not made out a *prima facie* case of obviousness.

With regard to the rejection of claims 14, we note that Obata teaches a mechanical seal with first and second seal members having mating surfaces for a mutual sliding engagement. See Obata at, for example, practical Example 1, page 6 of the translation. Secondly, we note that Plano discloses that it would have been obvious to make a polycrystalline diamond surface with a reduce wear characteristic such as the smooth cauliflower layer, which was not even tested for its tribological properties, inasmuch as it was known by those of ordinary skill that the smooth cauliflower morphology had a reduced resistance to wear.

As stated by appellant on pages 16 and 17 of the Appeal Brief,

At best, it [the combination of the disclosures of Obata and Plano] would result in a single layer of diamond with a cauliflower-like morphology as disclosed in Plano et al on the seal disclosed in Obata et al, a structure distinctly different from what is being claimed by Appellant. In Plano et al,

Appeal No. 96-2535
Application 08/028,473

the cauliflower-like material was not even tested for its wear characteristics, thereby leading those of ordinary skill in the art away from considering it for wear applications and teaching away from Applicant's invention. (Appellant's Brief, page 16-17).

We regard this as a clear admission that the subject matter of claim 14, which does not require two different morphological layers, would have been obvious just as posited by the appellant in the Brief. All claim 14 requires is a first layer of reduced wear characteristic. The underlying portion below this layer could also have the reduced wear characteristic. Claim 20 is also of this same scope. Therefore, the rejection of claims 14 and 20 under 35 U.S.C. § 103 is affirmed. With regard to claims 15 through 19, claim 15 requires both an underlayer and overlayer and one of ordinary skill would not have found this claimed subject matter to be obvious from Plano and Obata. Therefore, the rejection of claims 15 through 19 under 35 U.S.C. § 103 is reversed.

Pursuant to 37 CFR § 1.196(b), this Board enters the following rejection.

Appeal No. 96-2535
Application 08/028,473

Claims 14 and 20 are rejected under 35 U.S.C. § 112, second paragraph, for failing to particularly point out and distinctly claim the subject matter applicant regards as the invention. Claim 14 calls for a coating of polycrystalline diamond that has reduced resistance to wear in its exterior surface region. The specific wording of the claim would have raised in the mind of one of ordinary skill what the reduced resistance to wear of the coating is measured relative to. The claim gives no indication, inasmuch as no underlying layer or other structure of differing morphology is recited. Under these circumstances it is impossible to determine the metes and bounds of claim 14 and claim 20 dependent thereon. Accordingly, a rejection under 35 U.S.C. § 112, second paragraph, is proper.

SUMMARY

The rejection of claims 1, 13, and 19 under 35 U.S.C. § 112, first paragraph, has been reversed.

The rejection of claims 1 through 13 and 19 under 35 U.S.C.

§ 112, second paragraph, has been reversed.

Appeal No. 96-2535
Application 08/028,473

The rejection of claims 1, 2 and 7 under 35 U.S.C. § 102(b) has been reversed.

The rejection of claims 1 through 13 and 15 through 19 under 35 U.S.C. § 103 as been reversed.

The rejection of claims 14 and 20 under 35 U.S.C. § 103 has been affirmed.

Pursuant to 37 CFR § 1.196(b) a new rejection of claims 14 and 20 has been entered by the Board.

In addition to affirming the examiner's rejection of one or more claims, 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, "A new ground of rejection shall not be considered final for purposes of judicial review."

Regarding any affirmed rejection, 37 CFR § 1.197(b) provides:

(b) Appellant may file a single request for rehearing within two months from the date of the original decision

Appeal No. 96-2535
Application 08/028,473

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 (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. . . .

Should the appellant elect to prosecute further before
the

Primary Examiner pursuant to 37 CFR § 1.196(b)(1), in order to
preserve the right to seek review under 35 U.S.C. §§ 141 or
145 with respect to the affirmed rejection, the effective date
of the affirmance is deferred until conclusion of the
prosecution before the examiner unless, as a mere incident to
the limited prosecution, the affirmed rejection is overcome.

Appeal No. 96-2535
Application 08/028,473

If the appellant elects prosecution before the examiner and this does not result in allowance of the application, abandonment or a second appeal, this case should be returned to the Board of Patent Appeals and Interferences for final action on the affirmed rejection, including any timely request for rehearing thereof.

Appeal No. 96-2535
Application 08/028,473

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

AFFIRMED-IN-PART
37 CFR § 1.196(b)

IRWIN CHARLES COHEN)	
Administrative Patent Judge)	
)	
)	
)	
WILLIAM F. PATE, III)	BOARD OF PATENT
Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
)	
MURRIEL E. CRAWFORD)	
Administrative Patent Judge)	

Appeal No. 96-2535
Application 08/028,473

VOLKER R. ULBRICH
Norton Company
1 New Bond St
Box 15008
Worcester, MA 01615-0008

WFP/cam