

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.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. 18

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte HENRY W. BABEL,  
MARK M. HASEGAWA, and  
STEVEN A. DANEMAN

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Appeal No. 1997-2977  
Application No. 08/431,688

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ON BRIEF

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Before KIMLIN, GARRIS, and DELMENDO, Administrative Patent Judges.

DELMENDO, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1 through 14 and 22 through 26, which are all the claims pending in the subject application.

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

1. A substrate containing a thermal control coating having protected optical properties for use in low earth orbit outer space environments and which comprises

a non-ferrous metal substrate which does not have any substantial amount of surface reflectance, and which would thereby have a higher solar absorptance than it would otherwise have in absence of said thermal control coating,

a porous inorganic white paint thermal control coating on a surface of said substrate, said coating having low solar absorptance and high infrared emittance,

a fluoropolymer protective topcoat applied to said inorganic white paint coating in a high temperature application while maintaining the substrate at a relatively cool temperature to avoid structural damage to the substrate, said topcoat being at least partially impregnated into the pores of the porous thermal control coating, said topcoat being applied with sufficient thickness to protect the optical properties of the paint coating from darkening and otherwise being degraded by contaminants in a low-earth orbit outer space environment, said topcoat also having substantially no significant effect on the optical properties of said thermal control coating other than to protect same and having substantial adhesion to said inorganic white coating and being resistant to darkening under ultraviolet exposure in the outer space environment, and

said protective topcoat also having properties so that it is slowly eroded in a low earth orbit outer space environment thereby reducing contamination on said substrate and also withstanding thermal cycles of an outer space environment, but being sufficiently durable to

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easily withstand cleaning without destroying the topcoat in an earth non-space environment.

The subject matter on appeal relates to a substrate which contains a thermal control coating having certain protected optical properties and which is useful in a low earth orbit outer space environment (substitute appeal brief, page 3). The substrate comprises the recited non-ferrous metal substrate, the recited porous inorganic white paint thermal control coating, and the recited fluoropolymer protective topcoat. According to the appellants, the fluoropolymer topcoat protects the optical properties, but does not alter or reduce the solar reflectance, of the inorganic white paint (substitute appeal brief, page 4). Further, the appellants state that the fluoropolymer topcoat is sufficiently durable to easily withstand cleaning without destroying the topcoat in a non-space environment (id.).

The examiner relies upon the following prior art references as evidence of unpatentability:

Klahr 1978	4,074,482	Feb. 21,
Mozelewski et al. 1994 (Mozelewski)	5,290,424	Mar. 01,  (filed Jan. 31, 1992)



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Although the appellants' statement is equivocal, it fails to include an assertion that the appealed claims do not stand or fall together. Further, the appellants do not explain why the claims are separately patentable. Therefore, we select claim 1 from the group of rejected claims and decide this appeal as to the examiner's grounds of rejection on the basis of this claim alone. 37 C.F.R. § 1.192(c)(7) (1995).

We have carefully reviewed the entire record, including all of the appellants' arguments. This review leads us to conclude that the examiner's rejection under the fourth paragraph of 35 U.S.C. § 112 is not well founded. However, we find ourselves in agreement with the examiner as to the rejections under the second paragraph of 35 U.S.C. § 112 and 35 U.S.C. § 103. Accordingly, we affirm. The reasons for our determination follow.

We consider first the examiner's rejection of claim 7 under the fourth paragraph of 35 U.S.C. § 112. The fourth paragraph of 35 U.S.C. § 112 (1999) reads as follows:

Subject to the following paragraph, a claim in dependent form shall contain a reference to a claim previously set forth and then specify a further

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limitation of the subject matter claimed. A claim in dependent form shall be construed to incorporate by reference all the limitations of the claim to which it refers. [Underlining added.]

Thus, the fourth paragraph of section 112 requires a dependent claim to (1) refer to a previous claim and (2) specify a further limitation of the subject matter claimed.

The examiner states that claim 7 does not comply with the statute because it does not recite a further limitation of the subject matter claimed. Specifically, the examiner takes the following position:

Claim 7 is claiming a characteristic of the topcoat. This does not serve to further limit the composite in any way. [Examiner's answer, p. 4.]

We disagree. Claim 7 recites that the fluoropolymer topcoat is "resistant to shrinkage and flaking." This limitation is not recited in the previous claim (i.e., claim 1). It follows then that claim 7 complies with the statute because it specifies a further limitation of the subject matter claimed. Although the examiner states that "[c]laim 7 merely recites further characteristics which would have been present in known fluoropolymer materials, namely resistance to shrinkage and flaking" (examiner's answer, page 5), nothing in

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the record suggests that the fluoropolymer topcoat of claim 1 is necessarily or inherently resistant to shrinkage and flaking. To the contrary, the specification merely states that the fluoropolymer topcoat "should be resistant to shrinkage and flaking" (underlining added; page 15, lines 10-14). We therefore concur with the appellants that claim 7 complies with the fourth paragraph of 35 U.S.C. § 112.

We next address the examiner's rejection of claims 1 through 14 and 22 through 26 under 35 U.S.C. § 112, second paragraph. The second paragraph of 35 U.S.C. § 112 (1999) states:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

The "distinctly claiming" requirement means that the claims must have a clear and definite meaning when construed in light of the complete patent specification. Standard Oil Co. v. American Cyanamid Co., 774 F.2d 448, 452, 227 USPQ 293, 296 (Fed. Cir. 1985). Thus, section 112 ensures definiteness of claim language. In re Zletz, 893 F.2d 319, 322, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989). The test for definiteness is

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whether one skilled in the art would understand the bounds of the claim when read in light of the specification.

Orthokinetics, Inc. v. Safety Travel Chairs, Inc., 806 F.2d 1565, 1576, 1 USPQ2d 1081, 1088 (Fed. Cir. 1986). That is, a claim complies with the second paragraph of section 112 if, when read in light of the specification, it reasonably appraises those skilled in the art of the scope of the invention. Hybritech Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 1385, 231 USPQ 81, 94 (Fed. Cir. 1986).

Applying these principles to the present case, we are convinced that the appealed claims fail to distinctly claim what the appellants regard as their invention. As pointed out by the examiner, the appealed claims recite that the non-ferrous metal substrate or the anodic coating on the substrate does not have "any substantial amount of surface reflectance" (appealed claims 1, 12, and 25) or "any substantial amount of reflectance" (claim 23). However, the specification, as originally filed, does include an adequate written description for the characteristics defined by the recitations, much less

definitions for the recitations.<sup>1</sup> In the absence of a definition for the relative term "substantial," we concur with the examiner that one skilled in the relevant art would not be able to ascertain the scope of the appealed claims.

The appellants argue that the recitation in question "is not indefinite at any point of novelty" (appeal brief, page 8). We point out, however, that the test for indefiniteness under the second paragraph of 35 U.S.C. § 112 does not involve any question as to whether the claim language under consideration defines a novel feature of the claimed subject matter. Accordingly, the appellants' argument on this point is irrelevant.

The appellants further urge that "[o]ne of ordinary skill in the art clearly knows what constitutes any substantial surface reflectance in aluminum" (appeal brief, pages 8-9). This argument, however, is not supported by factual evidence. On this record, we determine that one skilled in the relevant

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<sup>1</sup> This raises the question of whether the appealed claims, as amended subsequent to the filing of this application, violates the written description requirement of 35 U.S.C. § 112, first paragraph. In the event of further prosecution, the examiner and the appellants should fully explore this issue.

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art would not be able to ascertain the scope of the appealed claims because the specification fails to set forth what the appellants would consider to be a "substantial" amount of surface reflectance. As we stated above, the term "substantial" is a relative term, which may vary on a case-by-case basis. We therefore hold that the examiner correctly rejected claims 1 through 14 and 22 through 26 under the second paragraph of 35 U.S.C. § 112.

Turning to the examiner's rejection under 35 U.S.C. § 103, the appellants state:

The Applicants admit that Babel, et al., as a prior art reference, would respond to all of the limitations of, for example, Claim 1 accept [sic, except] for the fluoropolymer protective topcoat. Thus, Applicants admit that the coating in Babel, et al. is used on a substrate to provide optical properties for use in low earth orbit outer space environments. Further, the Applicants admit that the first two clauses of Claim 1 are met by the Babel, et al. patent. It is clearly the fluoropolymer topcoat which is not taught in Babel, et al. [Substitute appeal brief, p. 10.]

Thus, a principal question raised in this appeal is whether one of ordinary skill in the art would have found it obvious within the meaning of section 103 to modify the substrate described in Babel by applying a fluoropolymer topcoat so as

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to arrive at the subject matter of appealed claim 1. We answer this question in the positive.

As candidly admitted by the appellants, Babel teaches a substrate which is identical to that recited in appealed claim 1, except for the fluoropolymer topcoat. Specifically, Babel teaches an article comprising an anodized aluminum surface and an inorganic coating of white paint (column 2, lines 63-65). According to Babel, "a high emittance low absorptance coating" on the aluminum surface is provided (column 2, line 65 to column 3, line 2). The anodized aluminum and the inorganic white paint, as described in Babel, fall within the scope of the "non-ferrous metal substrate" and the "porous inorganic white paint thermal control coating," as recited in appealed claim 1 (column 3, lines 34-43 and column 4, lines 8-25; specification, page 9, line 24 to page 10, line 12, and page 11, line 10 to page 12, line 4). Babel not only teaches that the coated substrates are useful for spacecraft applications (abstract; column 5, lines 58-68), but also suggests terrestrial applications, including "indoor or outdoor architectural or domestic application[s]" (column 4, lines 54-59).

Although Babel does not describe a coated substrate as recited in appealed claim 1, Babel discloses that it was known in the art to use silver-coated TEFLON films as a thermal control coating on aluminum in spacecraft structures (column 1, lines 39-46).<sup>2</sup> Thus, in addition to those reasons stated in the examiner's answer, we determine that it would have been prima facie obvious for one of ordinary skill in the art to modify Babel's coated aluminum substrate comprising a layer of inorganic white paint thermal control coating by applying a silver-coated TEFLON film as an additional layer of thermal control coating so as to result in a coated structure useful for spacecraft in high earth orbit, motivated by a reasonable expectation of obtaining the additive or cumulative effect of two known thermal control coating materials.<sup>3</sup> In our view,

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<sup>2</sup> The appellants' specification lists TEFLON as a suitable fluoropolymer (page 14, line 7).

<sup>3</sup> We realize that appealed claim 1 recites a particular method for applying the fluoropolymer protective topcoat onto the inorganic white paint coating. We observe, however, that the appealed claims are directed to a product and not a process. In re Thorpe, 777 F.2d 695, 697, 227 USPQ 964, 966 (Fed. Cir. 1985) (holding that if a 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 product was made

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the motivation or suggestion to combine two thermal control coatings to obtain their additive or cumulative effect flows logically from the teaching in the prior art that each is individually known for the same purpose.

In re Kerkhoven, 626 F.2d 846, 850, 205 USPQ 1069, 1072 (CCPA 1980).

Moreover, we agree with the examiner's ultimate conclusion that, for terrestrial applications, it would have been prima facie obvious for one of ordinary skill in the art to apply Mozelewski's fluoropolymer coating over the white paint coating of Babel's coated structure, motivated by a reasonable expectation of improving the weatherability of the structure (Mozelewski column 10, line 63 to column 11, line 5).

In re O'Farrell, 853 F.2d 894, 903-04, 7 USPQ2d 1673, 1680-81 (Fed. Cir. 1988).

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by a different process); In re Best, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977) (holding that the burden of proof shifts to an applicant where the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes).

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Once a prima facie case of obviousness is established, the burden of proof shifts to the appellants to rebut the prima facie case by presenting convincing argument or evidence (e.g., unexpected results). In re Mayne, 104 F.3d 1339, 1343, 41 USPQ2d 1451, 1455 (Fed. Cir. 1997) ("With a factual foundation for its prima facie case of obviousness shown, the burden shifts to applicants to demonstrate that their claimed fusion proteins possess an unexpected property over the prior art.").

Here, the appellants argue that Mozelewski "says nothing about an outer space environment" (substitute appeal brief, page 10). Further, the appellants urge that Mozelewski is not concerned with solving the same problem confronted by the appellants, i.e. the problem of protecting the white paint before the structure is placed in outer space (substitute appeal brief, pages 11-13). However, as admitted by the appellants (substitute appeal brief, page 12), Mozelewski provides a strong incentive or motivation for one of ordinary skill in the art to apply a fluoropolymer coating onto Babel's coated substrate, so as to arrive at the appellants' claimed invention, for the purpose of protecting the aluminum from

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earth environment degradation. In this regard, § 103 does not require that the applied prior art references be concerned with the same problem as the appellants. In re Kemps, 97 F.3d 1427, 1430, 40 USPQ2d 1309, 1311 (Fed. Cir. 1996) ("Although the motivation to combine here differs from that of the applicant, the motivation in the prior art to combine the references does not have to be identical to that of the applicant to establish obviousness.").

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The appellants allege as follows:

It must be recognized that Dr. Babel and a group of other scientists working at the company which is the assignee of this application, namely McDonnell Douglas Corporation, did not come up with the idea of using a fluoropolymer coating for quite some period of time and indeed, some period of time after the Babel et al. reference. Dr. Babel and the others who were working with Dr. Babel at McDonnell Douglas Corporation clearly recognized the problem as did the United States government, which basically uses the coating on spacecraft. Nevertheless, it clearly was not obvious to a group of people working with the United States and certainly not to the group working with Dr. Babel and certainly not obvious to Dr. Babel himself. Consequently, it is difficult to understand how that which apparently seems obvious to the Examiner was not obvious to a large number of top scientists working in this field. The simple fact is that it was not obvious. [Substitute appeal brief, pp. 13-14.]

We point out, however, that there is no factual evidence on this record to support this allegation. In this regard, it is well settled that mere lawyer's arguments and conclusory statements, which are unsupported by factual evidence, are entitled to little probative value. In re Geisler, 116 F.3d 1465, 1470, 43 USPQ2d 1362, 1365 (Fed. Cir. 1997); In re De Blauwe, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984); In re Wood, 582 F.2d 638, 642, 199 USPQ 137, 140 (CCPA 1978);

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In re Lindner, 457 F.2d 506, 508-09, 173 USPQ 356, 358 (CCPA 1972).

The appellants argue that Mozelewski's fluoropolymer coating is intended to remain on the coated structure whereas the fluoropolymer coating of their claimed invention is removed naturally after it has served its purpose of protecting the substrate in a terrestrial environment and the spacecraft comprising the substrate is placed in outer space (substitute appeal brief, pages 15-16). As we discussed above, however, the reason for using the same fluoropolymer in the prior art need not be identical to that of the appellants. Kemps, 97 F.3d at 1430, 40 USPQ2d at 1311. It is sufficient that the prior art references provide a teaching, suggestion, or motivation to use the same fluoropolymer to arrive at a product encompassed by appealed claim 1. Here, the TEFLON described in Babel is one of the named species for the fluoropolymer of the presently claimed invention (specification, page 14, lines 5-16). Similarly, Mozelewski's preferred fluoropolymer (column 8, lines 47-56) is chemically similar to the named fluoropolymer species as described in the specification and is therefore indistinguishable from the

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fluoropolymer recited in appealed claim 1. In our opinion, the mere fact that the fluoropolymer coating would have the recited properties does not, in and of itself, patentably distinguish the claimed product over the prior art. In any event, we point out that Babel teaches that TEFLON is subject to degradation at low earth orbit (column 1, lines 57 and 58), which is the same property recited in appealed claim 1. It also follows from Babel's teachings as a whole that TEFLON would be suitable as a thermal control coating in outer space environments other than low earth orbit (i.e., it must necessarily withstand the thermal cycles of outer space).

In summary, our judgment is as follows:

(1) the rejection of claim 7 under the fourth paragraph of 35 U.S.C. § 112 as being in improper dependent form is reversed;

(2) the rejection of claims 1 through 14 and 22 through 26 under the second paragraph of 35 U.S.C. § 112 as indefinite is affirmed; and

(3) the rejection of claims 1 through 14 and 22 through 26 under 35 U.S.C. § 103 as unpatentable over the combined teachings of Babel, Mozelewski, and Klahr is affirmed.

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The decision of the examiner is affirmed.

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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

EDWARD C. KIMLIN	)	
Administrative Patent Judge	)	
	)	
	)	
	)	
	)	BOARD OF PATENT
BRADLEY R. GARRIS	)	APPEALS
Administrative Patent Judge	)	AND
	)	INTERFERENCES
	)	
	)	
ROMULO H. DELMENDO	)	
Administrative Patent Judge	)	

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