

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 DELWIN JACKSON and LELAND G. CLOSE

Appeal No. 2005-1438
Application No. 10/027,433

ON BRIEF

Before PAK, DELMENDO and JEFFREY T. SMITH, *Administrative Patent Judges*.

PAK, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on an appeal under 35 U.S.C. § 134 from the examiner's refusal to allow claims 1 through 5, 8 and 13 through 17, which are all of the claims pending in the above-identified application.

According to appellants (Brief, page 3), "all of the claims stand together." Therefore, for purposes of this appeal, we select claim 1 from all of the claims on appeal and decide the

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propriety of the examiner's rejection based on this claim alone in accordance with 37 CFR § 1.192(c)(7)(2003) and 37 CFR § 41.37(c)(1)(vii)(2004). Claim 1 is reproduced below:

1. A method of producing an antimicrobial hard surface substrate comprising the steps of:
 - a) providing a hard surface substrate;
 - b) providing a sol-gel precursor formulation comprising a host precursor component and at least one metal-containing antimicrobial agent selected from the group consisting of metal-containing ion-exchange compounds, metal-containing zeolites, metal-containing glasses, and any mixtures thereof;
 - c) compounding said sol-gel firm precursor formulation to produce an adhesive sol-gel coating composition;
 - d) applying said sol-gel coating composition to at least a portion of said hard surface substrate; and
 - e) exposing said sol-gel coated hard surface substrate to a temperature of at most about 800°C to form a finished sol-gel film-coated hard surface substrate,

wherein said finished substrate exhibits a log kill rate for *Klebsiella pneumoniae* of at least 0.5 as measured under a modified plate contact method being JIS Z2801:2000 utilizing a phosphate buffer solution.

The references relied upon by the examiner are:

Oku et al. (Oku)	5,882,808	Mar. 16, 1999
Deith (Published World Intell. Prop. Org. Application)	WO 91/08179	Jun. 13, 1991

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Claims 1 through 5, 8 and 13 through 17 are rejected under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of Oku and Deith.

We have carefully reviewed the claims, specification, and applied prior art references, including all of the arguments advanced by both the examiner and the appellants in support of their respective positions. This review has led us to conclude that the examiner's Section 103 rejection is well founded. Accordingly, we affirm the examiner's Section 103 rejection for the findings of fact and conclusions set forth in the Answer. We add the following primarily for emphasis and completeness.

Under 35 U.S.C. § 103, the obviousness of an invention cannot be established by combining the teachings of the prior art references absent some suggestion or incentive supporting the combination. See *ACS Hosp. Sys., Inc. v. Montefiore Hosp.*, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). This does not mean that the cited prior art references must specifically suggest making the combination. See *B.F. Goodrich Co. v. Aircraft Braking Sys. Corp.*, 72 F.3d 1577, 1582, 37 USPQ2d 1314, 1318 (Fed. Cir. 1996); *In re Nilssen*, 851 F.2d 1401, 1403, 7 USPQ2d 1500, 1502 (Fed. Cir. 1988). Rather, the test for obviousness is what the combined teachings of the prior art

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references would have suggested to those of ordinary skill in the art. See *In re Young*, 927 F.2d 588, 591, 18 USPQ2d 1089, 1091 (Fed. Cir. 1991); *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). This test requires us to take into account not only the specific teachings of the prior art references but also any inferences which one skilled in the art would reasonably be expected to draw therefrom. See *In re Preda*, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968).

With the above obviousness test in mind, we turn to the examiner's rejection of claims 1 through 5, 8 and 13 through 17 under 35 U.S.C. § 103(a) as unpatentable over the combined teachings of Oku and Deith. We note that according to the appellants (Brief, page 4):

Deith teaches applying a silica-based glaze to a ceramic substrate by a sol-gel method, as an alternative to a conventional, high temperature firing glaze, wherein the glaze is formed by providing a sol-gel precursor formulation comprising a host precursor component, allowing the formulation to form a sol-gel, applying the sol-gel to the substrate and heating at temperatures of about 500°C to form a finished coating on the substrate (page 3, lines 12-34; Example).

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We find that Deith further teaches that its sol-gel process is superior to the conventional high temperature glazing method in glazing ceramic substrates, such as ceramic tiles or pottery ware. See pages 1, 3 and 4. We recognize that Deith is silent as to using the claimed antimicrobial agent in its sol-gel glazing process.

However, we find that Oku teaches an antibacterial and anti-fungal glaze composition for ceramic products, such as ceramic tiles and porcelain. See column 1, lines 8-43 and the abstract. According to column 4, lines 7-32, of Oku, this antibacterial and anti-fungal glaze composition can be mixed with a conventional glaze, inclusive of that described in Deith, and then affixed to the substrates of the ceramic products via "any conventional process." As one of the conventional glazing processes, Oku, for example, discloses mixing, coating and baking the antibacterial and anti-fungal glaze composition and the conventional glaze to form an antibacterial and anti-fungal glaze layer on the ceramic products (corresponding to the conventional high temperature glazing method not preferred by Deith). See column 2, lines 8-15, column 4, lines 26-31 and column 5, lines 15-35. The antibacterial and anti-fungal glaze composition contains, *inter alia*, an ion-exchange compound (e.g., aluminum silicate compounds

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and silica gel) carrying silver corresponding to the claimed antimicrobial agent. See column 3, lines 22-32. The above antibacterial and anti-fungal glaze composition is said to be useful in meeting the increasing sanitary requirement for ceramic products, such as ceramic tiles, since "the conventional glaze does not inherently possess anti-bacterial and anti-fungal properties" See column 1, lines 34-63.

Given the above teachings, we concur with the examiner that one of ordinary skill in the art would have been led to use the antibacterial and anti-fungal glaze composition, inclusive of the claimed antimicrobial agent (e.g., metal containing ion-exchange compounds) taught by Oku, with a conventional glaze, such as the one taught by Deith, in the form of a sol-gel, motivated by a reasonable expectation of successfully obtaining the benefits of both the sol-gel glazing method taught in Deith and the antibacterial and anti-fungal glaze composition taught in Oku. The nature of the problem in the art, i.e., the sanitary problem associated with ceramic products, such as ceramic tiles, would also have led one of ordinary skill in the art to employ the antibacterial and anti-fungal glaze composition taught in Oku in the sol-gel glazing process described in Deith.

The appellants do not dispute the examiner's determination that the claimed log kill rate for a bacterium, i.e., *Klebsiella pneumoniae*, would naturally flow from following the suggestion of the combined teachings of Deith and Oku.¹ Compare the Answer, page 4, with the Brief in its entirety.² Rather, the appellants appear to argue that Oku teaches away from using its antibacterial and anti-fungal composition in the sol-gel glazing process described in Deith. See the Brief, page 5. In support of this argument, the appellants focus on the examples in Oku, which are directed to a conventional high temperature glazing method. *Id.*

¹ *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Int. 1985), *aff'd. mem.*, 759 F.2d 1017 (Fed. Cir. 1986) (holding that the recognition of another advantage flowing naturally from following the suggestion of the prior art cannot be the basis for patentability when the difference would otherwise be obvious).

² We also determine that using an optimum amount of the antibacterial and anti-fungal composition to have at least the minimum bacterium log kill rate is well within the ambit of one of ordinary skill in the art since the purpose of using the antibacterial and anti-fungal composition is to kill a sufficient number of bacteria to provide a sanitary condition. In other words, the amount of the composition used or the bacterium log kill rate are result effective variables. *In re Boesch*, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980) ("[D]iscovery of an optimum value of a result effective variable in a known process is ordinarily within the skill of the art").

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We are not persuaded by this argument. As indicated *supra*, Oku is not limited to employing its antibacterial and anti-fungal composition in the conventional high temperature glazing method. Oku teaches that the antibacterial and anti-fungal glaze composition can be used with any conventional glaze, inclusive of that described in Deith, and can be affixed to the substrate of a ceramic product via "any conventional [glazing] process," inclusive of the sol-gel glazing process described in Deith. Oku also teaches that its antibacterial and anti-fungal glaze composition solves the sanitary problem associated with ceramic products, such as the ceramic tiles described in Deith. Thus, nothing in Oku teaches away from employing its antibacterial and anti-fungal glaze composition in Deith's sol-gel glazing process used for glazing ceramic products, such as ceramic tiles. In fact, the recognition of the sanitary problem associated with ceramic tiles, together with the knowledge of the benefits offered by both the antibacterial and anti-fungal glaze composition taught by Oku and the sol-gel glazing process taught by Deith, would have led one of ordinary skill in the art to arrive at the claimed subject matter within the meaning of 35 U.S.C. § 103.

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The appellants appear to argue that Deith cannot be properly combined with Oku since Deith is not from analogous art. See the Brief, pages 5-6. We cannot agree.

As stated in the court in *In re Clay*, 966 F.2d 656, 658-59, 23 USPQ2d 1058, 1060 (Fed. Cir. 1992):

Two criteria have evolved for determining whether prior art is analogous: (1) whether the art is from the same field of endeavor, regardless of the problem addressed, and (2) if the reference is not within the field of the inventor's endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved.

We find that Deith passes either criteria for analogous art set forth in *Clay*. We find that Deith, like Oku and the claimed subject matter, is directed to glazing or coating hard surfaces, such as the surfaces of ceramic products. Compare Deith, pages 1-3, with the specification, page 3 and Oku in its entirety. Thus, we concur with the examiner that Deith is within the inventors' field of endeavor. Moreover, we find that Deith, like the appellants, is directed to employing a low temperature sol-gel glazing process in order to avoid the high temperature condition associated with a conventional high temperature glazing method. Compare Deith, pages 1-3, with the specification, pages 3-4. Thus, we find that Deith is at least reasonably pertinent to the particular problem with which the inventors were involved.

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Thus, we determine that the evidence of obviousness, on balance, outweighs the evidence of nonobviousness proffered by the appellants. Hence, we affirm the examiner's decision rejecting all the appealed claims under 35 U.S.C. § 103.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv)(effective September 13, 2004; 69 Fed. Reg. 49960 (August 12, 2004); 1286 Off. Gaz. Pat. and TM Office 21 (September 7, 2004)).

AFFIRMED

CHUNG K. PAK)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
ROMULO H. DELMENDO)	APPEALS AND
Administrative Patent Judge)	INTERFERENCES
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CKP:hh

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