

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opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.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. 28

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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Ex parte WERNER HARTMANN and DIETER KERNER

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Appeal No. 1997-1793  
Application No. 08/528,044

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ON BRIEF

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Before GARRIS, WALTZ, 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 2 through 5, 9, and 10, which are the only claims pending in the subject application.

The subject matter on appeal generally relates to an iron oxide/titanium dioxide mixed oxide composition having the recited characteristics, wherein the mixed oxide is prepared

using the so-called "flame hydrolytic method," and to a process for making such a mixed oxide (specification, page 1, lines 22-30). According to the appellants, the claimed mixed oxide compositions exhibit improved UV light absorption as compared with products of the prior art (specification, page 2, lines 17-21; appeal brief, page 4).

The appealed claims are reproduced below:

2. Titanium dioxide powder composition consisting of a flame hydrolytically prepared iron oxide/titanium dioxide mixed oxide with a BET surface area of 10 to 150 m<sup>2</sup>/g, which contains 0.5 to 50 wt. % of iron oxide, with reference to the total amount, as a component of the mixed oxide.

3. A process for preparing the titanium dioxide powder which contains iron oxide according to claim 2 which comprises volatilizing anhydrous iron(III) chloride together with an inert gas, transferring the volatilized anhydrous iron(III) chloride to the mixing chamber of a burner, mixing the volatilized iron(III) chloride in the burner with hydrogen, air and gaseous titanium tetrachloride in a ratio which corresponds to the composition of the iron oxide/titanium dioxide mixed oxide, burning the 4-component mixture in a reaction chamber of said burner and separating the solid iron oxide/titanium dioxide mixed oxide from the gaseous reaction product.

4. A process as set forth in claim 3 including the step of removing adhering hydrogen chloride in moist air.

5. A titanium dioxide/iron(III) oxide mixed oxide powder prepared by the method of claim 3 or claim 4.



Appeal No. 1997-1793  
Application No. 08/528,044

Claims 2 through 5, 9, and 10 stand rejected under 35 U.S.C. § 103 as unpatentable over Kleinschmit in view of Hattori and Ishihara.

We refer to the appeal brief and to the examiner's answer for a complete exposition of the opposing viewpoints expressed by the appellants and by the examiner concerning the above noted rejection.

#### OPINION

For the reasons stated below, we cannot sustain the aforementioned rejection of claims 2 through 5, 9, and 10 under 35 U.S.C. § 103. Accordingly, we reverse. Further, we remand this application to the examiner for appropriate action as noted below.

We consider first the examiner's §103 rejection. The examiner's stated position is as follows:

. . . Kleinschmit et al. shows that it was known to make powders containing silica and either one of titania or iron oxide, made by the instant flame hydrolytic processes, but fails to explicitly teach that a combination of titania and iron oxide should be used in the absence of silica (col. 1, l. 30-65).

Hattori shows that it was known to make Ti/Fe mixed oxides by coprecipitating and hydrolyzing Ti and Fe, but fails to suggest *flame* hydrolysis (first page, Table 1, Table 4). ***In the absence of any showing of criticality or of unexpected results, it would have been a matter of obvious design choice to***

Appeal No. 1997-1793  
Application No. 08/528,044

***have used the methods of Kleinschmit et al. to make Ti/Fe mixed oxides of Hattori, for instance because the flame hydrolysis apparatus may be more readily available or produce the mixed oxide more economically.***

In the absence of any showing of unexpected results, it would have been obvious to have combined varying proportions of iron oxide and titania in order to vary the color or the catalytic activity of the powders of Hattori mad[e] by the process suggested by Kleinschmit et al. Still further, it would have been obvious to one of ordinary skill in the art to have used the thus obtained particles in cosmetics as is suggested by Ishihara in the absence of any showing of unexpected results. [Answer, pp. 3-4; italics original, bolded italics added.]

Thus, a principal question raised in this appeal is whether the collective teachings of the applied prior art references would have led one of ordinary skill in the art to use

Kleinschmit's pyrogenic method in the production of Hattori's binary oxides. We answer this question in the negative.

To properly reject claims under 35 U.S.C. § 103 as *prima facie* obvious in view of a combination of prior art references, the examiner must consider, *inter alia*, two factors: (1) whether the prior art would have suggested to one of ordinary skill in the art to make the claimed composition or carry out the claimed process; and (2) whether the prior art would also have revealed that, in so making or carrying out, the person of ordinary skill would have had a reasonable

Appeal No. 1997-1793  
Application No. 08/528,044

expectation of success. *In re Vaeck*, 947 F.2d 488, 493, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991)(citing *In re Dow Chemical Co.*, 837 F.2d 469, 473, 5 USPQ2d 1529, 1531 (Fed. Cir. 1988)). Both the suggestion and reasonable expectation of success must be founded in the prior art, not in applicants' disclosure. *Id.* Neither requirement has been satisfied here.

We find that Kleinschmit discloses a process for the production of pyrogenically produced silicon dioxide-mixed oxides having a BET surface area of 50 to 400 m<sup>2</sup>/g and containing 0.01 to 10 weight % zirconium dioxide, 0.1 to 10 weight % iron oxide, or 0.1 to 9.9 weight % titanium dioxide (column 1, lines 43-49). According to Kleinschmit, the process involves:

. . . vaporizing silicon tetrachloride, diluting it with preheated air, supplying the mixture to a known type of burner, mixing it there with hydrogen and with the vaporous chloride of iron, titanium or zirconium in such a ratio that the correspondingly composed silicon dioxide-mixed oxide results, burning the 4-component mixture in a reaction chamber, separating the solid silicon dioxide-mixed oxide obtained thereby from the gaseous reaction products by means of a known apparatus and freeing from adhering hydrogen chloride by heating in moist air. [Column 1, lines 50-60.]

Kleinschmit further teaches that the silicon dioxide-mixed oxide thus produced can be used as thermal insulating materials (column 2, lines 3-5). However, Kleinschmit does not teach or suggest that the disclosed silicon dioxide-mixed

Appeal No. 1997-1793  
Application No. 08/528,044

oxide can be used as a cosmetic article, lacquer, catalyst or photocatalyst (appealed claim 9) or as a skin cosmetic (appealed claim 10). Nor does Kleinschmit suggest, much less teach, the production of an iron oxide/titanium dioxide mixed oxide which is free from silicon dioxide (appealed claims 2-5).

In stark contrast to Kleinschmit, Hattori discloses various binary oxides of  $\text{Fe}_2\text{O}_3\text{-TiO}_2$  containing 10-90%  $\text{Fe}_2\text{O}_3$  and having surface areas of 21-62  $\text{m}^2/\text{g}$  (experimental section, Table 1, page 3208). According to Hattori, the binary oxides are useful as catalysts for the decomposition of 2-butanol (page 3208; Table 4, page 3212). Hattori further teaches that the disclosed binary oxides are produced by a coprecipitation method involving the steps of subjecting a mixed solution of ferric nitrate and titanium tetrachloride to hydrolysis with aqueous ammonia at a pH of 8-9 to form a precipitate, washing the precipitate with deionized water, drying the precipitate at 100°C for 20-30 hours, and then calcining the dried precipitate in air at 500°C for 2-3 hours (experimental section, page 3208).

Contrary to the examiner's stated position, we do not find any teaching or suggestion in the applied prior art references to use Kleinschmit's method of making silicon

Appeal No. 1997-1793  
Application No. 08/528,044

dioxide-mixed oxides, which are described as being suitable in the production of thermal insulation materials, to make the  $\text{Fe}_2\text{O}_3\text{-TiO}_2$  binary oxide 2-butanol decomposition catalysts of Hattori so as to arrive at the appellants' claimed subject matter. Additionally, we disagree with the examiner's conclusion (answer, page 8) that the teachings of the applied prior art references provide the requisite reasonable expectation of success in modifying Hattori as proposed by the examiner. In this regard, we note that the chemical and physical properties of Kleinschmit's product, which is suitable for making thermal insulation materials, are completely different from those of Hattori's 2-butanol decomposition catalyst. Unlike Hattori's catalyst, Kleinschmit's materials must necessarily contain a major amount of silicon dioxide in combination with minor amounts of zirconium dioxide, iron oxide, or titanium dioxide. Under these circumstances, it cannot be said that one of ordinary skill in the art would have had a reasonable expectation of success in using Kleinschmit's pyrogenic process, which is specifically limited to particular silicon dioxide mixed oxides useful for preparing thermal insulation materials, in the production of the specific 2-butanol decomposition catalysts (e.g.,  $\text{Fe}_2\text{O}_3\text{-TiO}_2$ ) described in

Appeal No. 1997-1793  
Application No. 08/528,044

Hattori. Also, while the examiner surmises that "flame hydrolysis apparatus may be more readily available or produce the mixed oxide more economically" (answer, page 3), the examiner has not pointed to, and we do not find, any factual basis in the record to support such an allegation.

As to Ishihara, the examiner has taken the position that Ishihara suggests using the mixed oxides of Hattori, as modified by Kleinschmit, for cosmetics (answer, pages 3-4). Further, the examiner has alleged that one of ordinary skill in the art would have been motivated to use Kleinschmit's flame hydrolytic method to make Ishihara's mixed oxides and would have had a reasonable expectation of success in doing so as an obvious design choice (answer, pages 7-8). However, the examiner has not properly established whether the Ishihara abstract is in fact prior art against the subject matter of the appealed claims, especially in view of the uncertainty of the publication date of this reference. In any event, we find that the examiner's position is not well founded because: (1) there is no teaching or suggestion in the prior art to use Kleinschmit's method to make Ishihara's product; and (2) there is no reasonable expectation of success from the prior art for doing so. *Vaech*, 947 F.2d at 493, 20 USPQ2d at 1442.

Appeal No. 1997-1793  
Application No. 08/528,044

We therefore determine that the examiner has not carried the initial burden of establishing a *prima facie* case of obviousness within the meaning of 35 U.S.C. § 103 against the subject matter of the appealed claims. *In re Rijckaert*, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993); *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992). Since the examiner's initial burden of proof has not been met, we need not address the sufficiency of the appellants' declaration evidence (Paper No. 9 and Paper No. 18) relative to the examiner's stated rejection. *In re Fine*, 837 F.2d 1071, 1076, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988).

The examiner's stated rejection under 35 U.S.C. § 103 of claims 2 through 5, 9, and 10 as unpatentable over Kleinschmit in view of Hattori and Ishihara is reversed.

REMAND TO THE EXAMINER

Upon the return of this application to the jurisdiction of the examiner, the following issues should be fully considered by the examiner.

1. Whether claims 2, 5, and 9 should be rejected under 35 U.S.C. § 102(b) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as unpatentable over Hattori.

Appeal No. 1997-1793  
Application No. 08/528,044

2. Whether JP 5-330,825 (JP '825), which is the underlying patent identified in the Ishihara abstract, qualifies as prior art under 35 U.S.C. § 102(a), taking into account the appellants' earliest U.S. filing date and claim for priority under 35 U.S.C. § 119, and if so, whether claim 10 should be rejected under 35 U.S.C. § 102(a) as anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as unpatentable over JP '825.

1. The Hattori Reference:

"To anticipate a claim, a prior art reference must disclose every limitation of the claimed invention, either explicitly or inherently." *In re Schreiber*, 128 F.3d 1473, 1477, 44 USPQ2d 1429, 1431 (Fed. Cir. 1997); accord *Glaxo Inc. v. Novopharm Ltd.*, 52 F.3d 1043, 1047, 34 USPQ2d 1565, 1567 (Fed. Cir. 1995). For a product claim, however, the mere fact that a prior art product is made by a process different from that recited in the claim does not, in and of itself, defeat an anticipation rejection over the prior art product. *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

Appeal No. 1997-1793  
Application No. 08/528,044

is unpatentable even though the prior product was made by a different process." ).

In *In re Best*, 562 F.2d 1252, 1255, 195 USPQ 430, 433-34 (CCPA 1977), the predecessor of our reviewing court explained as follows:

Where, as here, the claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes, the PTO can require an applicant to prove that the prior art products do not necessarily or inherently possess the characteristics of his claimed product. . . Whether the rejection is based on inherency under 35 U.S.C. 102, on prima facie obviousness under 35 U.S.C. 103, jointly or alternatively, the burden of proof is the same, and its fairness is evidenced by the PTO's inability to manufacture products or to obtain and compare prior art products. [Citations and footnotes omitted.]

The examiner should consider the teachings of Hattori with these legal principles in mind. As we discussed above, Hattori discloses various precipitated binary oxides of  $\text{Fe}_2\text{O}_3$ - $\text{TiO}_2$  containing 10-90%  $\text{Fe}_2\text{O}_3$  and having surface areas of 21-62  $\text{m}^2/\text{g}$  (experimental section, Table 1, page 3208). Although it is not entirely clear whether Hattori is referring to mole percents or weight percents in Table 1, it would appear that the product identified as " $\text{Fe}_2\text{O}_3$ - $\text{TiO}_2(1/9)$ " meets the iron oxide content as

recited in appealed claim 2.<sup>2</sup> In addition, we note that Hattori teaches a surface area of 62 m<sup>2</sup>/g for "Fe<sub>2</sub>O<sub>3</sub>-TiO<sub>2</sub>(1/9)," which satisfies the claim element with respect to surface area. As we have discussed above, Hattori teaches that the precipitated binary oxides, which have the same surface areas as the appellants' claimed catalyst powders (appealed claims 2, 5, and 9), are useful as catalysts for the decomposition of 2-butanol (page 3208; Table 4, page 3212).

In contrast to the subject matter of appealed claim 2 or 5, which recites a product prepared by flame hydrolysis, Hattori teaches that the disclosed binary oxides are produced by a coprecipitation method involving the steps of subjecting a mixed solution of ferric nitrate and titanium tetrachloride to hydrolysis with aqueous ammonia at a pH of 8-9 to form a precipitate, washing the precipitate with deionized water, drying the precipitate at 100°C for 20-30 hours, and then

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<sup>2</sup> If the percentages described for the compositions in Hattori's Table 1 are on total molar basis, the product identified as "Fe<sub>2</sub>O<sub>3</sub>-TiO<sub>2</sub>(1/9)" would contain about 18.2 wt.% of iron oxide. (We arrive at this calculation based on our observation that the molecular weights for Fe<sub>2</sub>O<sub>3</sub> and TiO<sub>2</sub> are 159.7 g/mol and 79.9 g/mol, respectively.) On the other hand, if the percentages are on total weight basis, the product would obviously contain 10 wt.% of iron oxide. Either way, Hattori's disclosed product appears to meet the claim element with respect to the iron oxide content.

Appeal No. 1997-1793  
Application No. 08/528,044

calcining the dried precipitate in air at 500EC for 2-3 hours (experimental section, page 3208). However, as in the appellants' flame hydrolysis preparation process (specification, page 1, line 31 to page 2, line 7; appealed claim 3), Hattori describes the coprecipitation method as reacting an iron salt with titanium tetrachloride and then treating the resulting product at elevated temperatures to yield an iron oxide-titanium oxide binary oxides having the same composition and the same surface area as recited in appealed claim 2. In this regard, we note that the appellants have contested the examiner's rejection as follows:

One of the critical features of the present invention is that the iron oxide/titanium dioxide mixed oxide is flame hydrolytically prepared. *This feature is believed to be critical to the invention because flame hydrolysis enables production of titanium dioxide having very small particle size, i.e., a BET surface area of 10-150 m<sup>2</sup>/g, as positively recited in claim 2. Such particles are advantageous because they have no pores, or very few pores which can be clogged with so-called secondary particles. [Underscoring original, italics added; brief, page 4.]*

Although Hattori uses a different preparation method, the final catalyst product identified as "Fe<sub>2</sub>O<sub>3</sub>-TiO<sub>2</sub>(1/9)" possesses the same composition and the same surface area as the "flame hydrolytically prepared" product recited in appealed claim 2. Under these circumstances, we think it is

Appeal No. 1997-1793  
Application No. 08/528,044

reasonable to conclude that the prior art product is indistinguishable from the appellants' claimed product and that it is appropriate to shift the burden of proof to the appellants to show a patentable difference. *Best*, 562 F.2d at 1255, 195 USPQ at 433-34; *In re Spada*, 911 F.2d 705, 708, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990)(reaffirming the principle that similarities in terms of reactants, reaction conditions, and properties amount to a *prima facie* case of unpatentability). The fairness in the shifting of the burden of proof here would be evidenced by the PTO's inability to conduct laboratory experiments. *Best*, 562 F.2d at 1255, 195 USPQ at 433-34.

As to claim 9, which further recites the UV absorption property of the claimed product, it is reasonable to believe that such a property would be inherent in the products described in Hattori, because the claimed product and the prior art product are indistinguishable. *Spada*, 911 F.2d at 709, 15 USPQ2d at 1658 ("When the claimed compositions are not novel they are not rendered patentable by recitation of properties, whether or not these properties are shown or suggested in the prior art.").

We note that two declarations (Paper No. 9 and Paper No. 18) have been filed during the prosecution in an attempt to

Appeal No. 1997-1793  
Application No. 08/528,044

show that the appellants' claimed product has novel and nonobvious properties.<sup>3</sup> However, the examiner should reevaluate this evidence to determine whether the evidence is sufficient to show that Hattori's products fail to necessarily or inherently possess the characteristics of their claimed product. Furthermore, the examiner should analyze whether the showing is commensurate in scope with the claims. In passing, we note that the descriptions of the comparative (prior art) mixed oxide as well as the inventive mixed oxide are vague (October 18, 1995 declaration, page 2). Thus, it is not possible to ascertain whether the runs are truly comparative (i.e., whether the experiments constitute back-to-back runs holding all variables constant except for the novel features of the claimed invention) and whether the showing is in fact commensurate in scope with the claims. For example, it is unclear whether the comparative product contains the same amount of iron oxide and possesses the same specific surface area as the inventive product identified as "pyrogenically

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<sup>3</sup> The first declaration filed on July 13, 1995 (Paper No. 9) was unexecuted and should therefore be given no weight. We note, however, that the second declaration filed October 18, 1995 (Paper No. 18), which is virtually identical to the first declaration, was executed.

Appeal No. 1997-1793  
Application No. 08/528,044

produced mixed oxide  $TiO_2PF_2$ ." Also, it is not clear whether the phrase "pyrogenically produced" is indicative of the production process as broadly recited in appealed claim 2 or claim 3. Similarly, it is not certain whether the comparative mixed oxide is in fact made by a process which corresponds to the process as described in Hattori. The examiner and the appellants should fully explore these issues.

2. JP '825:

With respect to JP '825, which was published on December 14, 1993, the examiner should first determine whether the document qualifies as prior art against the claimed subject matter. In this regard, we initially note that the present application is a continuation of Application No. 08/181,426 filed on January 14, 1994. However, we also observe that the appellants have claimed priority under 35 U.S.C. § 119 to German Patent Application No. P 43 02 896.9 filed February 2, 1993. Although the examiner has indicated on the face of the file wrapper that the appellants have met the conditions of 35 U.S.C. § 119, we do not find an accurate English language translation of the priority document pursuant to 37 CFR § 1.55 (1997) in the record. Nor do we find any entry in the

Appeal No. 1997-1793  
Application No. 08/528,044

"Contents" of the file wrapper of the present application<sup>4</sup> to clearly indicate that the appellants have submitted such an accurate English language translation. Thus, in the absence of an accurate English language translation of the priority document, it appears that JP '825 would qualify as prior art under 35 U.S.C. § 102(a).

If the examiner determines that JP '825 qualifies as prior art, the examiner should obtain a complete English language translation to fully evaluate the teachings of the reference as a whole. In reviewing the Derwent abstract of JP '825 (i.e., Ishihara), we find that the reference teaches a sunscreen composition containing a mixed oxide in which 1-15 wt.% of iron oxide is precipitated onto hydrated titanium oxide and then heat treated at 600EC. The examiner should consider the complete translation of JP '825 to determine whether the product of JP '825 is indistinguishable from the product as recited in appealed claim 10 and whether it would be appropriate to shift the burden of proof to the appellants to show that the prior art product would not necessarily or inherently possess the characteristics as recited in the claim. If claim 10 is to be rejected over JP '825 on this

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<sup>4</sup> We note that the "Contents" of the file wrapper of the parent application is missing, even though the present application is a file wrapper continuation application.

Appeal No. 1997-1793  
Application No. 08/528,044

basis, the examiner should reevaluate the declaration evidence and again notify the appellants why the declaration evidence is insufficient.

For the reasons stated above, we remand this application to the examiner for appropriate action. This application, by virtue of its "special" status, requires an immediate action, MPEP § 708.01, (D).

The decision of the examiner is reversed.

REVERSED AND REMANDED

BRADLEY R. GARRIS	)	
Administrative Patent Judge	)	
	)	
	)	
	)	
	)	BOARD OF PATENT
THOMAS A. WALTZ	)	APPEALS
Administrative Patent Judge	)	AND
	)	INTERFERENCES
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	)	
ROMULO H. DELMENDO	)	
Administrative Patent Judge	)	

Appeal No. 1997-1793  
Application No. 08/528,044

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