

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 SURYADEVARA V. BABU, ANURAG JINDAL
and SHARATH HEGDE

Appeal No. 2005-1459
Application No. 09/950,612

ON BRIEF

Before KIMLIN, OWENS and WALTZ, **Administrative Patent Judges**.

WALTZ, **Administrative Patent Judge**.

DECISION ON APPEAL

This is a decision on an appeal from the primary examiner's non-final rejection of claims 1 through 6, which are the only claims pending in this application. Although the examiner's action dated Nov. 20, 2003, was non-final, the claims on appeal have been twice rejected and thus we have jurisdiction pursuant to 35 U.S.C. § 134 (2003). See *Ex parte Lemoine*, 46 USPQ2d 1420, 1422-23 (Bd. Pat. App. & Int. 1998).

Appeal No. 2005-1459
Application No. 09/950,612

According to appellants, the invention is directed to novel abrasive slurries for chemical-mechanical polishing (CMP), where the slurries consist essentially of at least two inorganic metal oxides to provide improved metal polish rates, controlled polish rate selectivity, and low surface defectivity (Brief, page 2). Appellants state that each claim should be considered individually (Brief, page 3). To the extent appellants provide specific, substantive reasons for the patentability of individual claims, we consider these claims separately. See 37 CFR § 1.192(c)(7)(8)(2003); *In re McDaniel*, 293 F.3d 1379, 1383, 63 USPQ2d 1462, 1465 (Fed. Cir. 2002). Representative independent claim 1 is reproduced below:

1. In an abrasive slurry adapted for use in chemical-mechanical polishing of metals and oxides:

the improvement wherein the slurry consists essentially only of a mixture of at least two inorganic metal oxides selected from the group consisting of ceria, silica, alumina, zirconia, germania and titania.

The examiner has relied on Robinson et al. (Robinson), U.S. Patent No. 6,062,952, issued May 16, 2000, as the sole evidence of unpatentability. Claims 1, 2 and 5 stand rejected under 35 U.S.C. § 112, second paragraph, as indefinite (Answer, page

Appeal No. 2005-1459
Application No. 09/950,612

3). Claim 1 stands rejected under 35 U.S.C. § 102(b) as anticipated by Robinson (Answer, page 4). Claims 2-6 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Robinson (Answer, page 5).

Based on the totality of the record, we *affirm* the examiner's rejections based on sections 102(b) and 103(a) essentially for the reasons stated in the Answer and those reasons set forth below. We *reverse* the examiner's rejection based on section 112, second paragraph, for the reasons stated in the Brief, the Reply Brief and those reasons set forth below. Accordingly, the decision of the examiner is *affirmed*.

OPINION

A. The Rejection based on Section 112, Paragraph 2

The examiner states that the use of "slurry consists essentially only" in claim 1 on appeal is indefinite "because it is unclear how a slurry lacks a dispersing agent such as a liquid solvent" (Answer, page 3). The examiner maintains that the phrase "consisting essentially of" restricts the composition to the elements listed after the phrase (Answer, page 5).

It is well settled that the phrase "consisting essentially of" limits the scope of a claim to the specified ingredients and those that do not materially affect the basic and novel

Appeal No. 2005-1459
Application No. 09/950,612

characteristic(s) of a composition. See *PPG Indus. v. Guardian Indus. Corp.*, 156 F.3d 1351, 1354, 48 USPQ2d 1351, 1353-54 (Fed. Cir. 1998); *In re Herz*, 537 F.2d 549, 551-52, 190 USPQ 461, 463 (CCPA 1976); and *Ex parte Davis*, 80 USPQ 448, 450 (Bd. App. 1948). Accordingly, the examiner is incorrect in interpreting this phrase as restricting the composition to the ingredients listed. As disclosed by appellants on page 3 of their specification, a "typical slurry" consists of a solid phase of abrasive material and a liquid chemical solution phase. Therefore the scope of "slurry consists essentially of" (with or without the word "only") would have been clear to one of ordinary skill in this art. See *In re Warmerdam*, 33 F.3d 1354, 1361, 31 USPQ2d 1754, 1759 (Fed. Cir. 1994).

The examiner states that "the abrasive mixture" lacks antecedent basis in claims 2, 3, 5 and 6 (Answer, page 3).¹ On page 5, paragraph (11) of the Answer, the examiner apparently withdraws this portion of the rejection. Accordingly, this part of the rejection under paragraph two of section 112 is not before us on appeal (see *Other Issues* below).

¹We note that claim 6 has not been included in the statement of the rejection on page 3 of the Answer. This error is harmless in view of our disposition of this rejection.

Appeal No. 2005-1459
Application No. 09/950,612

The examiner states that claim 5 is "indefinite" since it is unclear how a slurry can contain silica when this abrasive has not been recited in base claim 1 on appeal (Answer, pages 3-4). As correctly argued by appellants, the examiner's rejection would have merit if claim 1 did not recite silica (Brief, page 7; Reply Brief, page 2). However, claim 1 in this application does recite silica, although claim 1 as reproduced in the Appendix to the Brief mistakenly omits "silica."² Accordingly, on the record in this application, we determine that the word "silica" in claim 5 finds antecedent basis in independent claim 1 on appeal.

For the foregoing reasons and those stated in the Brief and Reply Brief, we reverse the examiner's rejection of claims 1, 2 and 5 under 35 U.S.C. § 112, second paragraph.

B. The Rejection based on Section 102(b)

The examiner finds that Robinson discloses an abrasive slurry where the slurry contains at least one of ceria, silica, alumina, titania and zirconia (Answer, page 4). The examiner finds that Robinson's use of "at least one" encompasses the

²Appellants' reproduction of the claims on appeal also contains two typographical errors in claim 6 on appeal ("inorganic metal oxide" is listed twice and "eight" should read as "weight"). We note that the examiner has stated that the copy of the appealed claims contained in the Appendix to the Brief is correct (Answer, page 2, paragraph (8)).

Appeal No. 2005-1459
Application No. 09/950,612

claimed "mixture of at least two inorganic metal oxides" as required by claim 1 on appeal (*id.*). We agree.

Appellants argue that there is no recitation anywhere in the *specification* of Robinson of "at least one" regarding the abrasive metal oxides (Brief, page 9; Reply Brief, page 3). Appellants further argue that claims 2 and 22 of Robinson, which recite "at least one" of the metal oxide abrasives "and mixtures thereof," find no clear support and antecedent basis in the specification of Robinson (Brief, page 10) and thus should have been rejected on this basis (Reply Brief, page 4).

Appellants' arguments are not persuasive. Under section 102(b), anticipation requires that the prior art reference disclose, either expressly or under the principles of inherency, every limitation of the claim. See *In re King*, 801 F.2d 1324, 1326, 231 USPQ 136, 138 (Fed. Cir. 1986). To be prior art under section 102(b), a reference must be enabling, i.e., the reference must put the anticipatory subject matter at issue into the possession of the public through an enabling disclosure. See *Chester v. Miller*, 906 F.2d 1574, 1576 n.2, 15 USPQ2d 1333, 1336 n.2 (Fed. Cir. 1990); *In re Donohue*, 766 F.2d 531, 533, 226 USPQ 619, 621 (Fed. Cir. 1985); *In re LeGrice*, 301 F.2d 929, 936, 133 USPQ 365, 371-72 (CCPA 1962). However, a U.S. Patent is presumed

Appeal No. 2005-1459
Application No. 09/950,612

valid (35 U.S.C. § 282 (1999)) and the burden of proof is with appellants to establish that the disclosure of Robinson is non-enabling. Appellants have not attempted, much less met, this burden. We additionally note that the disclosure and teachings of Robinson are not restricted to the specification disclosure but also encompass the claims. Finally, we note that appellants admit that the "patent literature is replete with references to CMP processes reciting the use of a slurry including an inorganic metal oxide abrasive material selected from the group consisting of alumina, titania, zirconia, germania, silica, ceria and mixtures thereof" (specification, page 5, underlining added). Accordingly, the concept of using mixtures of abrasive inorganic metal oxides in CMP slurries was known to one of ordinary skill in this art. See *LeGrice*, 301 F.2d at 937, 133 USPQ at 372.

For the foregoing reasons and those stated in the Answer, we determine that the examiner has established a *prima facie* case of anticipation which has not been adequately rebutted by appellants. Therefore we affirm the examiner's rejection of claim 1 under section 102(b) over Robinson.

C. The Rejection based on Section 103(a)

The examiner finds that Robinson fails to specify the ratio and mean primary particle size of the two or more inorganic metal

Appeal No. 2005-1459
Application No. 09/950,612

oxides, as required by claims 3 and 6 (Answer, page 5).³ However, the examiner concludes that the proportions of each abrasive metal oxide and the particle sizes would have been obvious to one of ordinary skill in this art at the time of appellants' invention, given that the listed abrasives are considered equivalent for abrading purposes (*id.*). We agree. The law is replete with cases in which the difference between the claimed subject matter and the prior art is some range or other variable within the claims. These cases have consistently held that in such a situation, the applicant must show that the particular range is critical, generally by showing unexpected results for the claimed range. See *In re Woodruff (and cases cited therein)*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990). We note that appellants have not submitted any evidence regarding unexpected results for the ratios and particle sizes set forth in claims 3 and 6 on appeal.

With regard to claim 2 on appeal, appellants argue that there is no "hint of a suggestion" in Robinson that ceria and

³We note that Robinson does teach the effect of particle size for the abrasive particles in the slurry on the CMP process (col. 5, ll. 3-24).

Appeal No. 2005-1459
Application No. 09/950,612

alumina be combined (Brief, page 12). Appellants further argue that improved results are shown for this combination in Table 1 on page 9 of the specification (*id.*).

These arguments are not persuasive. First we note that the combination of ceria and alumina required by claim 2 on appeal is disclosed by Robinson at col. 15, ll. 50-54, with only seven possible materials that can be combined (our comments also apply to claim 5 on appeal directed to a combination of alumina and silica). Accordingly, the number of possible combinations disclosed by Robinson is so few that the combination of ceria and alumina would have been put in the possession of the public and thus be a bar under section 102(b). See *In re Sivaramakrishnan*, 673 F.2d 1383, 1384, 213 USPQ 441, 442 (CCPA 1982); and *In re Schaumann*, 572 F.2d 312, 316, 197 USPQ 5, 9 (CCPA 1978). It is well settled that anticipation is the epitome or ultimate of obviousness. See *In re Fracalossi*, 681 F.2d 792, 794, 215 USPQ 569, 571 (CCPA 1982). A showing of unexpected results is not appropriate to overcome a rejection for anticipation. See *In re Malagari*, 499 F.2d 1297, 1302-03, 182 USPQ 549, 553 (CCPA 1974). Even assuming *arguendo* that claim 2 (and claim 5) is obvious, appellants have not met their burden of explaining why the results in Table 1 on page 9 of the specification are considered

Appeal No. 2005-1459
Application No. 09/950,612

"improved," much less shown why these results are commensurate in scope with the claims. Furthermore, appellants have not explained the seemingly contradictory results in Table II (page 15 of the specification) where a single metal oxide and a mixed metal oxide produce the same polishing results.

Appellants argue that the ceria of claim 4 differs from other ceria, while agreeing with the examiner that ceria obtained from the current source is subject to change (Brief, page 14). We agree with the examiner that, absent a showing of a different ceria product, the ceria of Robinson must be considered no different from the ceria recited in claim 4 on appeal. We note that there is no evidence on this record that ceria obtained from Nyacol differs from the ceria disclosed by Robinson.

For the foregoing reasons and those stated in the Answer, we determine that the examiner has established a *prima facie* case of obviousness in view of the reference evidence. Based on the totality of the record, including due consideration of appellants' evidence and arguments, we determine that the preponderance of the evidence weighs most heavily in favor of obviousness within the meaning of section 103(a). Therefore we affirm the rejection of claims 2-6 under section 103(a) over Robinson.

D. Other Issues

In the event of further or continuing prosecution, the examiner should reconsider the withdrawal of the rejection of claims 2, 3, 5 and 6 under section 112, second paragraph (see the Answer, page 5, paragraph (11)), since the term "abrasive *mixture*" does not have antecedent basis in independent claim 1 on appeal (abrasive *slurry* does have antecedent basis but "mixture" does not)(italics added). The examiner and appellants should also consider the patentability of any claimed subject matter in light of the admitted prior art on page 5 of the specification. The examiner and appellants also should consider the patentability of claim 4 under section 112, paragraphs one and two, since appellants agree with the examiner that the ceria obtained from Nyacol is subject to change (Brief, page 14) and thus the scope of the claim, as well as how to make and use the invention, may not be ascertained by one of ordinary skill in this art. Finally, the examiner and appellants should review the consistency of the transitional phrases used in claims 1-6, keeping in mind the different scope given to "consists essentially of" (claims 1 and 6), "consists of" (claims 3 and 4), and "comprises" (claims 2 and 5). See *Davis, supra*.

Appeal No. 2005-1459
Application No. 09/950,612

E. Summary

The rejection of claims 1, 2 and 5 under 35 U.S.C. § 112, second paragraph, is reversed. The rejection of claim 1 under 35 U.S.C. § 102(b) over Robinson is affirmed. The rejection of claims 2-6 under 35 U.S.C. § 103(a) over Robinson is affirmed. Therefore the decision of the examiner is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv)(2004).

AFFIRMED

EDWARD C. KIMLIN)	
Administrative Patent Judge)	
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)	BOARD OF PATENT
TERRY J. OWENS)	
Administrative Patent Judge)	APPEALS AND
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THOMAS A. WALTZ)	
Administrative Patent Judge)	

TAW:hh

Appeal No. 2005-1459
Application No. 09/950,612

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