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Thomas Omholt Patent Prosecution Agent CABOT MICROELECTRONICS CORPORATION 870 NORTH COMMONS DRIVE AURORA, IL 60504			LU, JIONG-PING	
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte LUNG-TAI LU, WEN-CHENG LIU, and JIU-CHING CHEN

Appeal 2018-008645
Application 14/743,583
Technology Center 1700

Before BRADLEY R. GARRIS, CATHERINE Q. TIMM, and
KAREN M. HASTINGS, *Administrative Patent Judges*.

GARRIS, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1, 2, 5–11, 19, and 20. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

Appellant claims a method of polishing the surface of an aluminum alloy (e.g., an alloy of aluminum and copper as recited in dependent claim 2)

¹ We use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as Cabot Microelectronics Corporation. Appeal Br. 1.

comprising the step of abrading the surface with a polishing composition containing alumina abrasive particles comprising an anionic polymer on the surface of the alumina particles and a polishing promoter compound such as 1-hydroxyethylidene-1,1-diphosphonic acid (independent claim 1).

Appellant also claims a similar method wherein the polishing composition contains abrasive alumina particles comprising an anionic polymer on a surface of the alumina particles and the alumina particles are present at a concentration of about 0.01 wt.% to about 15 wt.% (remaining independent claim 19).

A copy of representative claims 1 and 19, taken from the Claims Appendix of the Appeal Brief, appears below.

1. A method of polishing an aluminum alloy surface comprising a step of abrading the surface with a polishing composition comprising an acidic or neutral pH aqueous carrier containing:

(a) alumina abrasive particles comprising an anionic polymer on the surface of the alumina particles; and

(b) a polishing promoter compound, wherein the polishing promoter compound is 1-hydroxyethylidene-1,1-diphosphonic acid, and wherein the polishing promoter compound is at a concentration in the range of about 0.01 wt.% to about 5 wt.%.

19. A method of polishing an aluminum alloy surface comprising a step of abrading the surface with a polishing composition comprising an acidic aqueous carrier containing abrasive alumina particles comprising an anionic polymer on a surface of the alumina particles, wherein the alumina abrasive particles are present in the composition at a concentration in the range of about 0.01 wt.% to about 15 wt.% during the step of abrading the surface, and a polishing promoter selected from the group consisting of 1-hydroxyethylidene-1,1-diphosphonic acid, camphorsulfonic acid, toluenesulfonic acid, formic acid,

sulfuric acid, phosphoric acid, phosphorous acid, or a combination of two or more thereof.

Appellant does not present separate arguments specifically directed to the dependent claims under rejection (*see generally* Appeal Br.). Therefore, the dependent claims will stand or fall with their parent independent claims.

Under 35 U.S.C. § 103, the Examiner rejects:

claims 1, 2, and 5–11 as unpatentable over Brusic (US 2008/0134585 A1, pub. June 12, 2008) in view of Hamaguchi (US 2011/0240594 A1, pub. Oct. 6, 2011); and

claims 19 and 20 as unpatentable over Prasad (US 2005/0153634 A1, pub. July 14, 2005) in view of Wolf (Wolf, S., & Tauber, R.N. (2000). *Multi-Level Interconnects for ULSI. Silicon processing for the vlsi era* (p. 757). Sunset Beach, CA: Lattice Press.).

We sustain these rejections for the reasons given in the Final Office Action, the Examiner's Answer, and below.

In rejecting independent claim 1, the Examiner finds that Brusic discloses a method of polishing an aluminum alloy (e.g., an alloy of aluminum and copper) surface using alumina abrasive particles of the type claimed in combination with an organic carboxylic acid such as citric acid but does not disclose the claimed 1-hydroxyethylidene-1,1-diphosphonic acid (Final 4). The Examiner finds that Hamaguchi discloses polishing an aluminum alloy surface using a mixture of acids including citric acid and 1-hydroxyethylidene-1,1-diphosphonic acid thereby achieving certain benefits (e.g., increased polishing rate) (*id.*). The Examiner concludes that it would have been obvious to combine Brusic's organic carboxylic acid such as citric

acid with 1-hydroxyethylidene-1,1-diphosphonic acid in order to achieve the benefits taught by Hamaguchi (*id.* at 4–5).

Appellant argues that “[i]n the substrate described by Hamaguchi, the NiP [of a magnetic disk substrate] is being polished, not the aluminum alloy used as a support” (Appeal Br. 4) and accordingly that Hamaguchi would not have suggested using 1-hydroxyethylidene-1,1-diphosphonic acid for polishing the aluminum alloy surface of Brusic (*id.*).

The Examiner responds by accurately finding that Hamaguchi is not limited to polishing a magnetic disk substrate (Ans. 3) and that “Hamaguchi specifically discloses ‘[e]xamples of the material of the substrate to be polished suitably used in the present invention include . . . aluminum, . . . copper, . . . or alloys thereof’” (*id.* at 4 (quoting Hamaguchi ¶ 128)). The Examiner additionally finds that Brusic likewise discloses polishing an alloy of aluminum and copper (*id.*). Based on these findings, the Examiner concludes that one having ordinary skill in this art would have found it obvious to combine Brusic and Hamaguchi in the manner proposed based upon a reasonable expectation of successfully achieving the benefits taught by a Hamaguchi (*id.* at 4–5).

In the Reply Brief, Appellant does not challenge the Examiner’s findings that Hamaguchi expressly teaches polishing an aluminum and copper alloy and that Brusic also discloses polishing such an alloy (*see* Reply Br. 4–5). Particularly given this lack of challenge, the record reflects that the applied references convincingly support the Examiner’s conclusion of obviousness. In short, Appellant fails to show error in the rejection of claims 1, 2, and 5–11 over Brusic in view of Hamaguchi.

Concerning remaining independent claim 19, the Examiner finds that Prasad discloses a method of polishing an aluminum alloy surface using abrasive alumina particles wherein the particles have an anionic polymer (i.e., polyacrylic acid) on their surface as claimed (Final 6 (citing Prasad ¶¶ 27–28)). The Examiner finds that Prasad is silent regarding a concentration of these particles (*id.*). With respect to this silence, the Examiner finds that Wolf teaches the concentration of abrasive particles is a result-effective variable impacting polishing rate (*id.*). The Examiner concludes that, in view of Wolf, it would have been obvious to optimize the concentration of Prasad’s abrasive alumina particles to achieve a desirable polishing rate, thereby resulting in a concentration within the claimed range (*id.*).

Appellant acknowledges, but does not meaningfully contest, the Examiner’s obviousness conclusion regarding Prasad in view of Wolf (Appeal Br. 5). Instead, Appellant argues, “Prasad does not teach or suggest alumina abrasive particles comprising an anionic polymer on the surface of the alumina particles, as required by the pending claims” (*id.*). Appellant characterizes the Examiner as proposing that Prasad’s alumina particles will be in contact with an anionic polymer (i.e., polyacrylic acid) film-forming agent and that it is reasonable to expect such contact would result in the particles having an anionic polymer on their surface (*id.* at 5–6). However, Appellant offers no reasoned analysis explaining why such a proposal is erroneous (*see id.*).

In response, the Examiner correctly finds that paragraph 28 of Prasad discloses a polishing composition comprising abrasive alumina particles and

anionic polymer film-forming agents such as polyacrylic acid (Ans. 6).² The Examiner determines, “[w]hen alumina particles are in contact with an anionic polymer in the composition, it is reasonable to expect that the alumina particles compris[e] an anionic polymer on the surface of the alumina particles, due to adsorption of the anionic polymer on the surface of the abrasive” (*id.*).

Significantly, Appellant does not dispute with any reasonable specificity the Examiner’s above finding and determination (*see* Reply Br. 5). For this reason and those expressed by the Examiner, Appellant fails to identify error in the § 103 rejection of claims 19 and 20 over Prasad in view of Wolf.

We affirm the Examiner’s decision to reject claims 1, 2, 5–11, 19, and 20.

CONCLUSION

In summary:

Claims Rejected	Basis	Affirmed	Reversed
1, 2, 5–11	§ 103 Brusic, Hamaguchi	1, 2, 5–11	
19, 20	§ 103 Prasad, Wolf	19, 20	
Overall Outcome		1, 2, 5–11, 19, 20	

² We observe that paragraph 28 of Prasad also discloses polystyrenesulfonic acid as a film-forming agent and that Appellant’s anionic polymer is defined in claim 5 as comprising polystyrenesulfonic acid.

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TIME PERIOD

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