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The McDermott Building
500 North Capitol Street, N.W.
Washington, DC 20001

EXAMINER

IVEY, ELIZABETH D

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte YOSHIFUMI TAKASU, YOSHIO OKAYAMA, AKIHIKO
ISHIBASHI, ISAO TASHIRO, AKIO UETA, MASAKI NOBUOKA, and
NAOYA RYOKI

Appeal 2021–001290
Application 15/424,244
Technology Center 1700

BEFORE JEFFREY T. SMITH, BEVERLY A. FRANKLIN, and
JEFFREY R. SNAY, *Administrative Patent Judges*.

FRANKLIN, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the
Examiner’s decision to reject claims 1, 3, and 5–7. We have jurisdiction
under 35 U.S.C. § 6(b).

We REVERSE.

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 Management Co.,
Ltd. Appeal Br. 3.

CLAIMED SUBJECT MATTER

Claim 1 is illustrative of Appellant's subject matter on appeal and is set forth below:

1. A RAMO_4 substrate comprising a single crystal represented by a formula of RAMO_4 (in the formula, R indicates one or a plurality of trivalent elements selected from a group consisting of Sc, In, Y, and a lanthanoid element, A indicates one or a plurality of trivalent elements selected from a group consisting of Fe(III), Ga, and Al, and M indicates one or a plurality of bivalent elements selected from a group consisting of Mg, Mn, Fe(II), Co, Cu, Zn, and Cd), wherein
an epitaxially-grown surface is provided on a first surface of the RAMO_4 substrate, a satin-finish surface is provided on a second surface of the RAMO_4 substrate, and the satin-finish surface has surface roughness which is larger than a surface roughness of the epitaxially-grown surface, the satin-finish surface having an unevenness of 0.5 μm to 500 μm , and
surface roughness R_a in a region of 100 m^2 of the epitaxially-grown surface is at least 0.08 nm and no greater than 0.5 nm.

Appeal Br. 15 (Claims App.).

REFERENCES

The prior art relied upon by the Examiner is:

Name	Reference	Date
Yoshida	US 6,303,405 B1	Oct. 16, 2001
Hansen	US 2016/0032486 A1	Feb. 4, 2016
Inoue	JP 2012064886 A	Mar. 29, 2012
Yoshii	JP 2013102023 A	May 23, 2013

REJECTIONS

1. Claims 1, 3, and 7 are rejected under 35 U.S.C. § 103 as being unpatentable over Yoshii in view of Yoshida as evidenced by Hansen.

2. Claims 5 and 6 are rejected under 35 U.S.C. § 103 as being unpatentable over Yoshii in view of Yoshida as evidenced by Hansen, and further in view of Inoue.

OPINION

We review the appealed rejections for error based upon the issues identified by Appellant and in light of the arguments and evidence produced thereon. *Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential), *cited with approval in In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011) (“[I]t has long been the Board’s practice to require an applicant to identify the alleged error in the examiner’s rejections.”). After considering the evidence presented in this Appeal (including the Examiner’s Answer, the Appeal Brief, and the Reply Brief), we are persuaded that Appellant identifies reversible error. Thus, we reverse the Examiner’s rejections for the reasons stated by Appellant in the record, and add the following primarily for emphasis.

The dispositive issue in this appeal is whether the Examiner has made the case that a sapphire substrate is functionally equivalent to a RAMO₄ substrate in terms of surface polishing properties.

We refer to the Examiner’s rejection made on pages 3–4 of the Final Office Action. Therein, the Examiner states that Yoshii teaches a single crystal substrate polished on both sides. Yoshii, ¶¶ 41 and 37. Final Act. 4. The Examiner states that Yoshii teaches the surface roughness on the front side as set to about 0.01 nm or more, and 0.3 nm or less (¶28) which (as

evidenced by Hansen), can be achieved using known fixed abrasive and polishing methods, and which significantly overlaps an Ra of at least 0.08 nm, and no greater than 0.5 nm. The Examiner states that Yoshii teaches the surface roughness on the back side as several tens nm or more and several μm or less (§13) and teaches a particular example of 0.6 μm (600 nm) (satin finish) (§40). Final Act. 4.

The Examiner recognizes that Yoshii does not teach a substrate that is a RAMO_4 substrate having the claimed formula. Final Act. 4.

The Examiner refers to Yoshida and states that Yoshida teaches ScAlMgO_4 as one of the material options for a single crystalline substrate as a functional equivalent to sapphire for epitaxial growth. Yoshida, col. 20, ll. 52–54 and 58–59). Final Act. 4.

The Examiner concludes that it would have been obvious to have provided a single crystal substrate with a surface as claimed, as taught by Yoshii, but comprising a RAMO_4 formula wherein R is Sc, A is Al, M is Mg, as taught by Yoshida as a functional equivalent to sapphire for an epitaxial substrate. Final Act. 4.

We agree with Appellant's position on pages 7–10 of the Appeal Brief, and Appellant's stated reply made on pages 3–7 of the Reply Brief, which we incorporate herein by reference. Therein, Appellant explains in detail how a sapphire substrate and a RAMO_4 substrate are not in fact equivalent to each other in terms of surface polishing properties, contrary to the Examiner's belief. We add that it is noted that the Examiner's reliance upon Yoshida is misplaced. As discussed above, the Examiner states that Yoshida teaches ScAlMgO_4 as one of the material options for a single crystalline substrate as a functional equivalent to sapphire *for epitaxial*

growth [emphasis added] (Final Act. 4); but this is not for surface polishing properties.

In view of the above, we reverse Rejection 1. We reverse Rejection 2 for the same reasons (the Examiner does not rely upon the additionally applied reference in Rejection 2 to cure the stated deficiencies of Rejection 1).

CONCLUSION

We reverse the Examiner's decision.

DECISION SUMMARY

In summary:

Claim(s) Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1, 3, 7	103	Yoshii, Yoshida, Hansen		1, 3, 7
5, 6	103	Yoshii, Yoshida, Hansen, Inoue		5, 6
Overall Outcome				1, 3, 5–7

REVERSED