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The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte YOSHIHIRO TAKAHASHI,
YASUO KAMIGATA, HIKARI MURAI, MASAHIRO AOSHIMA,
SHINJI TSUCHIKAWA, MASATO MIYATAKE,
TOMOHIKO KOTAKE, and HIROYUKI IZUMI

Appeal 2019-003334
Application 15/133,838
Technology Center 1700

Before JEFFREY T. SMITH, GEORGE C. BEST, and
JEFFREY W. ABRAHAM, *Administrative Patent Judges*.

ABRAHAM, *Administrative Patent Judge.*

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from the Examiner's decision to reject claims 1–8. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

[1] We use the word Appellant to refer to "applicant" as defined in 37 C.F.R. § 1.42(a). Appellant identifies the real party in interest as Hitachi Chemical Company, Ltd. Appeal Br. 2.

CLAIMED SUBJECT MATTER

The claims are directed to a laminate plate used in semiconductor packages and printed wiring boards. Spec. ¶ 1. The plate comprises a base material coated with a thermosetting resin composition that has low thermal expansion characteristics as well as good drilling processability and heat resistance properties. *Id.* Claim 1, reproduced below from the Claim Appendix (Appeal Br. 12), is illustrative of the claimed subject matter:

> 1. A laminate plate for wiring boards, obtained by coating a thermosetting resin composition containing (E) a thermosetting resin, (F) silica, and (G) at least one molybdenum compound selected from calcium molybdate, and magnesium molybdate, with a content of the silica (F) being 20% by volume or more and not more than 60% by volume of the thermosetting resin composition, on a base material in a film form or fiber form, then performing semi-curing to form a prepreg, and laminating and molding the prepreg.

REJECTIONS ON APPEAL

On appeal, the Examiner maintains the rejection of claims 1–8 under 35 U.S.C. § 103 as unpatentable over Ogima[2] in view of Mori.[3] Final Act. 4–9; Ans. 4.

[2] Ogima et al., US 6,361,866 B1, issued Mar. 26, 2002.
[3] Mori, et al., WO 2006/129480 A1, published December 7, 2006. For convenience, the Examiner, without objection from Appellant, relies on the English language counterpart, US 2010/0190899 A1, published July 29, 2010.

OPINION

We sustain the above rejection based primarily on the Examiner's findings of fact, conclusions of law, and rebuttals to Appellant's arguments, as expressed in the Final Action and Answer. The following comments are added for emphasis.

Appellant presents arguments for independent claim 1, but does not present any arguments for the dependent claims that depend from these claims. Therefore, we limit our discussion to independent claim 1, which we select as representative under 37 C.F.R. § 41.37(c)(1)(iv). By this rule, claims 2–8 stand or fall with claim 1.

The Examiner finds that Ogima discloses a resin composition comprising an epoxy resin (i.e., a thermosetting resin), a molybdenum compound, and a filler, and a substrate impregnated with the resin composition or to which the resin composition is applied. Ans. 4 (citing Ogima, Abstract, 4:14–24); Final Act. 5. The Examiner further finds that Ogima lists calcium molybdate as an example of a molybdenum compound, and silica as an example of a filler. Ans. 4–5 (citing Ogima, 3:62–4:24); Final Act. 5.

The Examiner acknowledges that Ogima does not disclose the use of a specific type or amount of silica in the resin composition, but contends that Mori discloses an epoxy resin composition comprising a filler such as spherical silica or spherical fused silica in an amount of 0.1 to 80 mass % and more preferably 30 to 70 mass %. Ans. 7 (citing Mori ¶¶ 81–82); Final Act. 7. According to the Examiner, Mori teaches that spherical silica or spherical fused silica are desirable because they can improve the properties of the hardened material formed from the resin, including high glass

transition temperature, low linear expansion coefficient, tensile strength, elongation, and flexibility. Ans. 7 (citing Mori ¶ 76); Final Act. 8. The Examiner thus determines that it would have been obvious to a person of ordinary skill in the art to use the amount and type of silica disclosed in Mori in Ogima's resin composition to provide desirable properties of the hardened material. Ans. 8; Final Act. 8.

Appellant argues that Ogima only discloses calcium molybdate and silica as single members of separate lists, and that none of Ogima's examples include calcium molybdate or silica. Appeal Br. 5–6. Appellant thus argues that, absent hindsight, there would have been no reason to select calcium molybdate from Ogima's list of molybdate compounds, and silica from Ogima's list of optional fillers, and combine these materials in a thermosetting resin composition. *Id.* at 6; Reply 4. Appellant further argues that Mori does not cure this deficiency because Mori describes a filler as optional and is silent regarding the combination of calcium molybdate with silica in a thermosetting resin. Appeal Br. 6–7. Appellant also argues that a person of ordinary skill in the art "would not have thought to use the silica and amounts thereof taught by [] Mori to improve the drilling processability" of a laminate plate because, according to Appellant, it was known that increasing silica lowered drilling processability. Reply 5.

Appellant also contends the claimed invention provides "unexpectedly superior results over the subject matter that is disclosed in Ogima." Appeal Br. 7. Appellant directs us to Tables 2–5 in the Specification in support of its assertion that Examples 6 and 7 "provided excellent drilling processability and low thermal expansion properties and no problems with respect to moldability and electrical insulating properties," whereas the

comparative examples demonstrated inferior moldability, electrical insulating properties, and drilling processability. *Id.* at 8. Appellant argues these improved properties would have been unexpected in view of Ogima because Ogima does not disclose how to achieve these improved properties, the amount of silica to use, or the effect of the amount of silica used. *Id.* at 9.

We are not persuaded by Appellant's arguments. It is undisputed that Ogima teaches the combination of calcium molybdate and silica. *See, e.g.*, Ans. 4–5; Final Act. 5; App. Br. 6. The fact that these components appear as single members of separate lists, are listed among several other possible ingredients, and are not used in the examples does not detract from the fact that the reference teaches the combined use of these two components. For purposes of an obviousness analysis, we look to the entire reference for all that it teaches or suggests to a person of ordinary skill in the art. *See In re Mouttet*, 686 F.3d 1322, 1331 (Fed. Cir. 2012). Furthermore, the fact that Ogima suggests the combination of the claimed components undermines Appellant's hindsight argument. It also renders moot Appellant's argument that Mori does not cure the purported deficiency in Ogima.

As to Appellant's arguments regarding combining the teachings of Mori and Ogima (Reply 5), Appellant does not direct us to any documentary evidence supporting the assertion that increasing silica results in lower drilling processability. The Examiner, however, does direct us to documentary evidence demonstrating that using a specific amount of spherical fused silica in resin compositions can provide desirable properties of the hardened material, such as high glass transition temperature, low linear expansion coefficient, tensile strength, elongation, and flexibility.

Ans. 7; Mori ¶ 76. In view of this, and considering that Ogima itself discloses the use of silica, we agree with the Examiner that a person of ordinary skill in the art would have had a reason to use the spherical fused silica with the content (i.e., 40 Vol. %) of Mori in the resin composition of Ogima, namely to provide desirable properties of the hardened material. Ans. 12.

With regard to Appellant's unexpected results arguments, we agree with the Examiner's position that Appellant's data is not commensurate in scope with the claims. Ans. 13–14. For example, whereas the claims encompass, *inter alia*, any type of silica between 20% and 60% by volume, Appellant has not provided data to show the alleged unexpected results occur over the entire claimed range of silica. *Id.* at 14 (noting, in particular, that Appellant failed to present any data when the silica content is at the upper limit of 60% by volume). We are not persuaded by Appellant's response that the tests results for Example 6, containing 49% by volume of silica, are sufficient because "49% by volume of silica is reasonably close to the claimed content of silica being not more than 60% by volume." Reply 8. Appellant offers no evidence to support this assertion. *See In re Clemens*, 622 F.2d 1029, 1036 (CCPA 1980).

In addition, Appellant offers no persuasive response to the Examiner's finding that the claimed invention does not provide unexpected results because Examples 1, 2, 4 and 5 in the Specification provide the same advantageous properties as Examples 6 and 7, but use zinc molybdate, a compound not recited in the claims. Ans. 14 (also noting that zinc molybdate is used in Ogima examples 1–7); *see* Reply 9 (responding only by seeking comment from the Board on a broader claim scope).

For all of the foregoing reasons, we are not persuaded that the Examiner erred in rejecting claims 1–8 as obvious under 35 U.S.C. § 103 in view of Ogima and Mori.

CONCLUSION

The Examiner's rejections are affirmed.

DECISION SUMMARY

In summary:

Claim(s) Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1–8	103	Ogima, Mori	1–8	

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

AFFIRMED