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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MASAKI MORITA, KONATSU NAKAMURA, and
SHIN TAKANEZAWA

Appeal 2018-000612
Application 13/816,206
Technology Center 1700

Before ADRIENE LEPIANE HANLON, ROMULO H. DELMENDO, and
MONTÉ T. SQUIRE, *Administrative Patent Judges*.

SQUIRE, *Administrative Patent Judge*.

DECISION ON APPEAL¹

Appellants² appeal under 35 U.S.C. § 134(a) from the Examiner’s decision to finally reject claims 12 and 28–34.³ We have jurisdiction under 35 U.S.C. § 6(b). We AFFIRM.

¹ In explaining our Decision, we refer to the Specification filed February 8, 2013 (“Spec.”); Final Office Action dated October 6, 2016 (“Final Act.”); Advisory Action dated January 23, 2017 (“Adv. Act.”); Appeal Brief filed May 19, 2017 (“Br.”); and Examiner’s Answer dated August 24, 2017 (“Ans.”).

² Appellants identify Hitachi Chemical Company, Ltd. as the real party in interest. Br. 2.

³ Claims 1–7, 26, and 27 are withdrawn and claims 8–11, 13–25, 29, and 30 canceled. Br. 5, 27–29.

The Claimed Invention

Appellants' disclosure relates to a method for manufacturing a wiring board, the wiring board having an insulating resin layer formed from a resin composition. Spec. ¶ 1. Claim 12 is illustrative of the claimed subject matter on appeal and is reproduced below from the Claims Appendix to the Appeal Brief (Br. 27–28):

12. A method for manufacturing a wiring board having an insulating resin layer formed from a resin composition containing an epoxy resin having two or more epoxy groups in one molecule thereof and having a structural unit derived from an alkylene glycol having a carbon number of from 3 to 10 in a main chain thereof, an active ester group-containing compound, and an epoxy resin curing accelerator, which performs successively

a laminate forming step of forming a laminate having the insulating resin layer and a support such that the insulating resin layer faces a wiring circuit of a circuit-provided insulating substrate,

a hole forming step of providing a hole in the laminate,

a desmearing treatment step of removing a smear within the hole with a desmearing treatment liquid,

a support removal step of removing the support from the laminate, and

a wiring forming step of forming wiring on the surface of the insulating resin layer from which the support has been removed, wherein

a step of irradiating ultraviolet rays on the insulating resin layer is included after the laminate forming step and before the wiring forming step, the irradiation with ultraviolet rays performed using an ultraviolet ray lamp, and wherein the insulating resin layer is not treated with an oxidizing roughening liquid

during the step of irradiating ultraviolet rays on the insulating resin layer.

The References

The Examiner relies on the following prior art references as evidence in rejecting the claims on appeal:

| | | |
|--------------------------------|--------------------|---------------|
| Sugioka et al., ("Sugioka") | US 5,733,823 | Mar. 31, 1998 |
| Lake | US 5,987,739 | Nov. 23, 1999 |
| Kondo et al., ("Kondo") | US 2009/0288870 A1 | Nov. 26, 2009 |
| Heishi et al., ("Heishi") | WO 2010/024391 A1 | Mar. 4, 2010 |

The Rejections

On appeal, the Examiner maintains (Ans. 4) the following rejections⁴:

1. Claims 12, 29, 31, and 33 rejected under 35 U.S.C. § 103(a) as being unpatentable over Kondo in view of Lake and Heishi ("Rejection 1").

Ans. 3.

2. Claims 28, 30, 32, and 34 rejected under 35 U.S.C. § 103(a) as being unpatentable over Kondo in view of Lake, Heishi, and Sugioka ("Rejection 2"). Ans. 11.

OPINION

Having considered the respective positions advanced by the Examiner and Appellants in light of this appeal record, we affirm the Examiner's

⁴ For both Rejections 1 and 2, the Examiner's citations to the Heishi reference are to the English translation, Heishi et al., US 2011/0217512 A1, published Sep. 8, 2011. Ans. 4, 11.

rejections based on the fact-finding and reasoning set forth in the Answer, Advisory Action, and Final Office Action, which we adopt as our own. We highlight and address specific findings and arguments below.

Rejection 1

Appellants argue claims 12, 29, 31, and 33 as a group. Br. 5. We select claim 12 as representative, and the remaining claims subject to this rejection stand or fall with claim 12. 37 C.F.R. § 41.37(c)(1)(iv).

The Examiner determines that the combination of Kondo, Lake, and Heishi suggests a method for manufacturing a wiring board satisfying all of the steps of claim 12 and thus, concludes that the combination would have rendered the claimed subject matter obvious. Ans. 4–8 (citing Kondo, Abstract, Figs. 4A–4C, 5A–5C, 6A–6C, ¶¶ 8, 26, 43–45, 48, 53, 54, 61, 65; Lake, Abstract, 7:26–28, 7:42–44, 8:26–44, 10:2–6, 13:37–42; Heishi, Abstract, ¶¶ 1, 14, 15, 26, 39, 41, 50, 51, 104, 105, 128, 169, 177, 179, 187, 188, Figs. 1, 2, 3A–3D).

Appellants argue that the Examiner’s rejection should be reversed because “a person skilled in the art would not have reasonably expected a successful outcome . . . in view of the teachings of Kondo, Heishi, and Lake.” Br. 6. In particular, Appellants contend that a person of ordinary skill in the art would not have had a reasonable expectation of success in combining the teachings of the cited art because: (1) Lake and Heishi are directed to different materials and goals (Br. 6, 7); (2) Lake’s dry UV treatment would remove what Heishi teaches is essential for successfully adhering a wiring layer to an epoxy resin (*id.* at 6); and (3) Lake’s dry UV treatment would lead to conditions that Heishi teaches are detrimental to properly adhering a wire layer to an epoxy resin (*id.* at 6).

We do not find Appellants' arguments persuasive of reversible error in the Examiner's rejection. On the record before us, we find that a preponderance of the evidence and sound technical reasoning support the Examiner's analysis and determination that the combination of Kondo, Lake, and Heishi suggests a method for manufacturing a wiring board satisfying all of the steps of claim 12, and the Examiner's conclusion that the combination would have rendered the claim obvious. Kondo, Abstract, Figs. 4A–4C, 5A–5C, 6A–6C, ¶¶ 8, 26, 43–45, 48, 53, 54, 61, 65; Lake, Abstract, 7:26–28, 7:42–44, 8:26–44, 10:2–6, 13:37–42; Heishi, Abstract, ¶¶ 1, 14, 15, 26, 39, 41, 50, 51, 104, 105, 128, 169, 177, 179, 187, 188, Figs. 1, 2, 3A–3D.

The Examiner also provides a reasonable basis and identifies a preponderance of the evidence in the record to evince why one of ordinary skill would have combined the teachings of the cited references to arrive at Appellants' claimed method and would have had a reasonable expectation of success in doing so. Ans. 6, 8. *See also KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 420 (2007) (explaining that any need or problem known in the art can provide a reason for combining the elements in the manner claimed).

Appellants fail to direct us to persuasive evidence or provide an adequate technical explanation to establish why the Examiner's articulated reasoning for combining the teachings of the prior art to arrive at the claimed invention lacks a rational underpinning or is otherwise based on some other reversible error.

We do not find Appellants' argument that a person would not have had a reasonable expectation of success because Lake and Heishi are directed to different materials and goals (Br. 6, 7) persuasive based on the fact-finding and well-stated reasoning provided by the Examiner at pages

20–23 of the Answer. In particular, we concur with the Examiner’s determination (Ans. 21) that, based on Lake’s teaching that UV treatment without an oxidizing liquid improves the adhesion of the conductive trace and is an alternative to a plasma or corona treatment to break surface bonds (Lake, 2:13–22, 3:63–4:7, 6:50–64, 10:6–9, 10:16–26), and Kondo’s teaching regarding the use of UV treatment for surface roughening to improve adhesion of a metal layer as an alternative to a plasma treatment (Kondo ¶¶ 8, 22, 61, 63), it would have been obvious to a person having ordinary skill in the art at the time of the invention that the UV treatment alone without oxidizing liquid would have been reasonably expected to improve the adhesion between the polymer surface and the metal layer.

Appellant’s arguments at pages 6–9 of the Appeal Brief are not persuasive of reversible error because they are largely conclusory, and Appellants do not provide an adequate technical explanation or direct us to persuasive evidence in the record to support them. Attorney argument is not evidence. *In re De Blauwe*, 736 F.2d 699, 705 (Fed. Cir. 1984).

Moreover, the fact that Lake and Heishi may be directed to “different goals,” without more, is not persuasive of reversible error because the references need not be directed to the same problem that Appellants’ claimed invention addresses. *KSR*, 550 U.S. at 420 (in making an obviousness determination, cautioning that it is error to “look only to the problem the patentee [or applicant] was trying to solve”).

We do not find Appellants’ argument that Lake’s dry UV treatment would remove what Heishi teaches is essential for successfully adhering a wiring layer to an epoxy resin (Br. 6) persuasive based on the fact-finding and for the reasons provided by the Examiner at page 23 of the Answer. In

particular, as the Examiner finds (Ans. 23) and contrary to what Appellants' argue, although Heishi discusses using a roughening liquid when a roughening treatment is performed (Heishi ¶ 37), Heishi's method does not require that a roughening step be performed (*id.* ¶ 201 (disclosing that "[t]here is no particular limitation in the method for performing the roughening treatment")). Thus, as the Examiner finds (Ans. 23), the inclusion of a roughening liquid would not have been considered by one of ordinary skill to be essential.

Appellants' argument that Lake's dry UV treatment would lead to conditions that Heishi teaches are detrimental to properly adhering a wire layer to an epoxy resin (Br. 6) is equally unpersuasive. As the Examiner finds (Ans. 23–24), although Heishi discusses that the temperature and heating time during curing needs to be adjusted to provide sufficient cooling (Heishi ¶¶ 195–196), there is no teaching or suggestion that over curing or fully curing the epoxy would necessarily provide undesirable results, as Appellants argue. Appellants' arguments do not reveal reversible error in the Examiner's factual findings and analysis in this regard.

Appellants argue that Kondo and Heishi teach away from the claim step of "irradiating ultraviolet rays on the insulating resin layer is included after the laminate forming step and before the wiring forming step . . . wherein the insulating resin layer is not treated with an oxidizing roughening liquid during the step of irradiating ultraviolet rays on the insulating resin layer." Br. 12–13 (citing Kondo ¶¶ 61, 63, claim 4; Heishi ¶ 201). In particular, Appellants contend that paragraph 61 of Kondo discloses utilization of a UV irradiation process including dipping of an insulation layer in a TiO₂ solution and, when read as a whole with paragraph 63 and

claim 4 of Kondo, it shows that an oxidizing liquid is present during the UV treatment of Kondo. *Id.* at 13. Appellants also contend that paragraph 201 of Heishi discloses a roughening treatment including an oxidizing liquid. *Id.* at 13.

We do not find Appellants' teaching away argument persuasive of reversible error because those portions of Kondo and Heishi upon which Appellants rely do not "criticize, discredit, or otherwise discourage the solution claimed." *In re Fulton*, 391 F.3d 1195, 1201 (finding that there is no teaching away where the prior art's disclosure "does not criticize, discredit, or otherwise discourage the solution claimed"). We will not read into the references a teaching away where no such language exists. *Cf. DyStar Textilfarben GmbH v. C.H. Patrick Co.*, 464 F.3d 1356, 1364 (Fed. Cir. 2006).

Moreover, as the Examiner finds (Ans. 25–26), although paragraph 61 of Kondo describes an example of irradiating the resin while in a TiO₂ suspended solution, such disclosure does not negate or teach away from Kondo's broad disclosure regarding treating the surface with UV irradiation generally (¶ 61 (disclosing that "the surface roughening of the interlayer insulating layer 30 may be executed by UV (ultraviolet ray) irradiation")). *In re Susi*, 440 F.2d 442, 445–46 (CCPA 1971) (disclosure of particularly preferred embodiments does not teach away from broader disclosure). Appellants' argument that paragraphs 61 and 63 and claim 4 of Kondo, when read as a whole, show that an oxidizing liquid is present during the UV treatment of Kondo (Br. 13) is not persuasive because Kondo's teachings are not limited to the disclosure of specific working examples or embodiments. *In re Mills*, 470 F.2d 649, 651 (CCPA 1972); *In re Fracalossi*, 681 F.2d 792,

794 n.1 (CCPA 1982) (A prior art reference’s disclosure is not limited to its examples.) Indeed, all of the disclosures in a prior art reference “must be evaluated for what they fairly teach one of ordinary skill in the art.” *In re Boe*, 355 F.2d 961, 965 (CCPA 1966).

Contrary to what Appellants’ argument suggests, paragraphs 61 and 63 of Kondo, when read in context, do not require that an oxidizing liquid be used during the UV treatment. Rather, paragraph 63 merely describes yet another embodiment involving a second roughening process and discloses that “UV irradiation can be employed in the second roughening process step” and “preferably the second roughening process step is set to the conditions that a roughening power applied to the interlayer insulating layer **30** is made.” Claim 4 of Kondo is also directed to a specific embodiment “on which a roughening treatment is performed.”

Similarly, paragraph 201 of Heishi merely discloses “examples” that include using a roughening treatment liquid. *Susi*, 440 F.2d at 445–46. In addition, paragraph 201 of Heishi broadly states that “[t]here is no particular limitation in the method for performing the roughening treatment,” which does not require that an oxidizing liquid be used. Absent more, we are not persuaded that such disclosure constitutes a teaching away from Appellants’ claimed method.

Appellants argue further that the claimed invention yields unexpected results. Br. 26–27. In particular, Appellants contend that Examples 1–11, reported in Table 1 of the Specification (Spec. ¶ 105), “each displayed unexpectedly excellent adhesion of the wiring.” Br. 13.

This argument is not persuasive. In attempting to overcome a prima facie case of obviousness by showing unexpected results, the burden rests

with Appellants to establish (1) that the alleged unexpected results presented as being associated with the claimed invention are, in fact, unexpected, (2) that the comparisons are to the disclosure of closest prior art, and (3) that the supplied evidentiary showing is commensurate in scope with the claimed subject matter. *See In re Klosak*, 455 F.2d 1077, 1080 (CCPA 1972).

Based on the fact-finding and for the well-stated reasons provided by the Examiner at pages 26–27 of the Answer, we concur with the Examiner that Appellants have not provided data sufficient to show that there is actually a difference between the results obtained through the claimed method and those of the closest prior art (Kondo). As the Examiner finds (Ans. 27), the experimental results provided in Table I do not include any comparison between UV treatment in conjunction with an oxidizing liquid and UV treatment without an oxidizing liquid. Appellants also do not adequately explain why the alleged improvements in adhesion Appellants contend are shown in Table I are considered to be unexpected results and not just typical results by one of ordinary skill in the art. *Klosak*, 455 F.2d at 1080 (“[T]he burden of showing unexpected results rests on [the applicant] who asserts them.”).

As the Examiner further finds (*id.* at 27), the data provided in Table I do not indicate that improved results would be expected over the full range of UV active esters. *See In re Kao*, 639 F.3d 1057, 1068 (Fed. Cir. 2011) (“Evidence of secondary considerations must be reasonably commensurate with the scope of the claims.”).

Appellants’ assertion that “each displayed unexpectedly excellent adhesion of the wiring” (Br. 13) is conclusory and, without more, insufficient to establish unexpected results. *De Blauwe*, 736 F.2d at 705 (“It

is well settled that unexpected results must be established by factual evidence. Mere argument or conclusory statements in the specification does not suffice.”).

Accordingly, we affirm the Examiner’s rejection of claims 12, 29, 31, and 33 under 35 U.S.C. § 103(a) as obvious over the combination of Kondo, Lake, and Heishi.

Rejection 2

Appellants do not present any additional substantive arguments in response to the Examiner’s Rejection 2, stated above. Rather, Appellants repeat and rely on principally the same arguments previously presented above in response to the Examiner’s rejection of claim 12 (Rejection 1, stated above). *Compare* Br. 15–25 (Appellants’ response to Rejection 2), *with* Br. 5–15 (Appellants’ response to Rejection 1).

Accordingly, based on the findings and technical reasoning provided by the Examiner and for the same reasons discussed above for affirming the Examiner’s Rejection 1, we affirm the Examiner’s Rejection 2.

DECISION/ORDER

The Examiner’s rejections of claims 12 and 28–34 are affirmed.

It is ordered that the Examiner’s decision is affirmed.

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