

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AMKOR TECHNOLOGY, INC.,
Petitioner,

v.

TESSERA, INC.,
Patent Owner.

Case IPR2013-00242
Patent 6,046,076

Before KEVIN F. TURNER, JUSTIN T. ARBES, and
CARL M. DeFRANCO, *Administrative Patent Judges*.

Opinion for the Board filed by *Administrative Patent Judge* TURNER, in
which ARBES, *Administrative Patent Judge*, joins, and DeFRANCO,
Administrative Patent Judge, joins-in-part

DeFRANCO, *Administrative Patent Judge*, joining-in-part and dissenting-
in-part.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

Amkor Technology, Inc. (“Amkor”) filed a Petition (“Pet.,” Paper 1)¹ requesting *inter partes* review of claims 1–8, 10–13, 17–19, and 22–25 of U.S. Patent No. 6,046,076 (“the ’076 Patent”). Patent Owner Tessera, Inc. (“Tessera”) filed a Preliminary Response thereto (“Prelim. Resp.,” Paper 8). Taking into account the Patent Owner Preliminary Response, we determined that the information presented in the Petition demonstrated that there was a reasonable likelihood that Amkor would prevail with respect to its challenge of claims 1–8, 10–13, 18, 19, 24, and 25. Pursuant to 35 U.S.C. § 314, the Board instituted this trial on October 11, 2013, as to claims 1–8, 10–13, 18, 19, 24, and 25 of the ’076 Patent. Paper 37 (“Dec.”).

After institution, Tessera filed a Patent Owner Response (Paper 76 (“PO Resp.”)), and Amkor filed a Reply to the Patent Owner Response (Paper 102 (“Reply”)). Oral hearing was held on June 12, 2014.²

We have jurisdiction under 35 U.S.C. § 6(c). This final written decision is entered pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. We determine that Amkor has not proven by a preponderance of the evidence that claims 1–8, 10–13, 18, and 19 of the ’076 Patent are unpatentable. We do, however, determine that Amkor has proven by a

¹ Page 49 of the Petition was corrected in a subsequent filing. See Paper 32, 6.

² A transcript (“Tr.”) of the oral hearing is included in the record. Paper 131.

preponderance of the evidence that claims 24 and 25 of the '076 Patent are unpatentable.

A. Related Proceedings

Amkor indicates that a complaint alleging infringement of the '076 Patent was filed July 6, 2012, stylized *Tessera, Inc. v. Amkor Technology, Inc.*, Civil Action No. 1:12-cv-00852-SLR, in the U.S. District Court for the District of Delaware. Pet. 1; see Ex. 1027. Tessera discloses that the parties entered into a license agreement relating to certain patents of Tessera in 1996. Prelim. Resp. 2–5. Amkor indicates that the '076 Patent was later the subject of an arbitration proceeding, pertaining to that agreement, *Amkor Technologies, Inc. v. Tessera, Inc.*, International Chamber of Commerce (ICC) International Court of Arbitration, Case No. 16531/VRO. Pet. 2.

B. The '076 Patent

The '076 Patent relates to the encapsulation of a semiconductor chip and a mounting substrate under a subatmospheric pressure to minimize gas entrapment in the encapsulant. Ex. 1007, Abs. Prior to curing, a higher pressure is applied causing the collapse of any voids in the encapsulant. *Id.*

Figure 1 of the '076 Patent illustrates an apparatus, according to one embodiment, which may be used in the methods claimed in the '076 Patent. The apparatus depicted in Figure 1 is reproduced below with numerical features labeled:

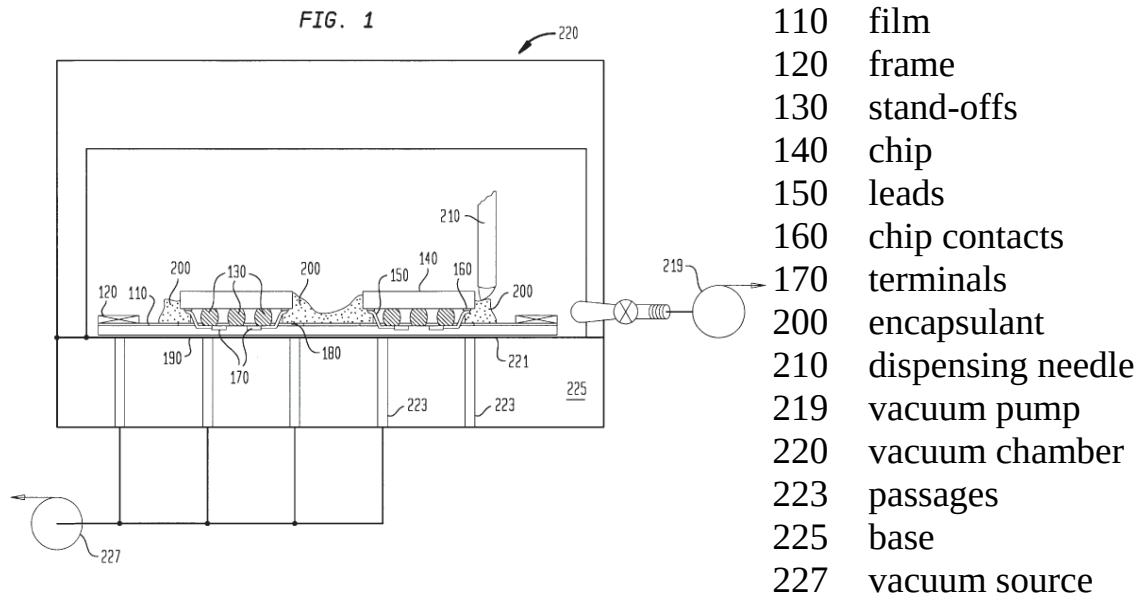


Fig. 1 illustrates an encapsulating apparatus

The Specification of the '076 Patent discloses that a film (110) may be disposed on a frame (120), with chips (140) attached thereto through the use of stand-offs (130). Ex. 1007, 5:3–14. Although not illustrated in Fig. 1, the Specification of the '076 Patent discloses “a semiconductor chip package assembly 100,” which is encapsulated. *Id.* at 5:4–5. Thereafter, electrically conductive leads (150) are bonded to respective chip contacts (160) to create connections to the terminals (170). *Id.* at 5:14–23. The assembly is placed in a vacuum chamber (220), having vacuum applied through a vacuum pump (219), where encapsulant (200) is applied through a dispensing needle (210) around the periphery of the chip (140). *Id.* at 5:29–39. Additionally, to ensure that the parts remain properly aligned, a vacuum also can be applied to the substrate through passages (223) to a vacuum source (227) in the base (225) of the vacuum chamber (220). *Id.* at 5:48–55.

C. Challenged Claims

Independent claims 1 and 24, along with dependent claims 2–8, 10–13, 18, 19, and 25, are challenged by Amkor in this *inter partes* review.

Claim 1 is illustrative and is reproduced below:

1. A method of encapsulating a microelectronic assembly comprising the steps of
 applying a flowable encapsulant to the assembly *while maintaining the assembly under a subatmospheric pressure*,
 then bringing the assembly to a higher pressure above said subatmospheric pressure after completion of said encapsulant-applying step and holding the assembly at said higher pressure, and curing said encapsulant after bringing the assembly to said higher pressure.

Ex. 1007, 14:29–41 (emphasis added).

D. Prior Art Relied Upon

Amkor relies upon the following prior art references with respect to the instituted grounds:

Oldham	US 4,681,718	July 21, 1987	Ex. 1003
Nakano	JP S63-241955 ³	Oct. 7, 1988	Ex. 1001
Kovac	WO 96/09746	Mar. 28, 1996	Ex. 1004
Hwang	EP 0 691 679 A2	Jan. 10, 1996	Ex. 1006

³ We refer to the English translation of the original reference as “Nakano.” Amkor provided an affidavit attesting to the accuracy of the translation. See Ex. 1001; 37 C.F.R. § 42.63(b).

E. Grounds of Unpatentability

We instituted the instant trial based on the following grounds of unpatentability:

Claim(s)	Basis	Reference(s)
1–5	§ 102(b)	Oldham
6-8, 10-13, and 18	§ 103	Oldham and Kovac
19	§ 103	Oldham and Nakano
24 and 25	§ 102(b)	Hwang

Dec. 34.

II. ANALYSIS

A. Claim Construction

We begin our analysis by determining the meaning of the claims. In an *inter partes* review, claim terms in an unexpired patent are given their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b). Under the broadest reasonable construction standard, claim terms are given their ordinary and customary meaning as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *In re Translogic Tech. Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).⁴

⁴ The claim construction standard for this proceeding was determined in our Order of May 22, 2014. Paper 129. This order addressed a terminal disclaimer filed by Tessera with respect to the '076 Patent.

In the Decision on Institution, we construed several claim terms, including “a porous layer,” “an equilibrium state,” “applying said encapsulant along a plurality of edges seriatim,” “microelectronic assembly,” and “encapsulant.” Dec. 14–19. We discern no reason to deviate from those claim constructions for the purposes of this decision.

B. Principles of Law

To prevail in its challenges to the patentability of claims, Amkor must establish facts supporting its challenges by a preponderance of the evidence. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). A claim is anticipated, and, thus, unpatentable, if a single prior art reference discloses each and every element of the claimed invention. *See Schering Corp. v. Geneva Pharms.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003).

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

We analyze the instituted grounds of unpatentability in accordance with the above-stated principles.

C. Claims 1–5 – Anticipation by Oldham

Amkor asserts that claims 1–5 are unpatentable under 35 U.S.C. § 102(b) as anticipated by Oldham. Pet. 45–50. As support, Amkor relies on the declaration of Dr. Alexander D. Glew (Ex. 1008). Amkor contends that Oldham encapsulates assemblies of components with synthetic resin materials, where the resin may be introduced under vacuum, and thereafter, Oldham increases the pressure in the mold “to burst any remaining bubbles and cause the filler to compact and the resin to encapsulate the filler,” (Ex. 1003, 8:23–25); under the increased pressure, the mold temperature is maintained at a specific temperature until the resin/filler mixture has sufficiently cured. Pet. 45–47.

Tessera counters that Oldham does not disclose applying a flowable encapsulant to the assembly while maintaining the assembly under a subatmospheric pressure, per claim 1. PO Resp. 43–50. Tessera argues that our decision to initiate review is based on an incorrect factual assumption, that “[r]esin may be introduced under vacuum” in Oldham refers to the state of the resin, and that adding resin to the mold is not the same as applying resin to the assembly. *Id.* In support of its argument, Tessera proffers Dr. Martin Goosey’s declaration (Ex. 2055).

Upon review of the parties’ arguments and supporting evidence, we determine that Amkor has not demonstrated by a preponderance of the

evidence that claims 1–5 are unpatentable under 35 U.S.C. § 102(b) as being anticipated by Oldham.

In our Decision, we opined that “[i]f there were a way of introducing the resin under vacuum without having the area of application be under some type of vacuum, Tessera has not provided such a counter-formulation.” Dec. 21. We find Dr. Goosey’s testimony to be responsive to the point we raised in the Decision on Institution and at least partially dispositive.

Dr. Goosey presents a number of encapsulation designs that fall within the scope of the apparatus described in Oldham, in which the resin is introduced under vacuum, i.e., “[t]he resin may be introduced under vacuum,” (Ex. 1003, 8:1), but the article within the mold is not maintained under vacuum. *See* Ex. 2055 ¶¶ 173–217. Dr. Goosey testifies that “Oldham provides little detail on the construction of its compression molding and transfer molding equipment or the details of the processing steps. All of this missing information would be necessary to draw conclusions about what is the inherent or necessary result of practicing the Oldham methods.” *Id.* at ¶ 88. Thus, although Oldham’s statement that “[t]he resin may be introduced under vacuum” (Ex. 1003, 8:1) may appear, at first, to be clear, one of ordinary skill in the art would have different interpretations as to what that statement discloses.

Dr. Goosey details multiple types of encapsulation processes and molding apparatuses that one of ordinary skill in the art would have understood at the time of invention, including references Schroeder and Wang (Exs. 2050, 2072) that illustrate those processes. *Id.* at ¶¶ 94–133.

Dr. Goosey also explains in detail that if the resin is under vacuum, that does not necessarily mean that the cavity is under vacuum (*Id.* at ¶¶ 127, 180–185), that if the mold is under vacuum, that does not necessarily mean that the cavity is under vacuum (*Id.* at ¶¶ 196–197, *see also* Paper 76 at 45, 47 (for explanatory diagrams)), and that if the cavity is under vacuum, that does not necessarily mean that the assembly is under vacuum (*Id.* at ¶¶ 198–217). Dr. Goosey testifies to the possibility that the pressure on the assembly may rise during resin addition, (*Id.* at ¶¶ 208–217), which is acknowledged by Amkor’s declarant, Dr. Glew. Ex. 2054, 193:24–197:17. We find Dr. Goosey’s testimony persuasive that Oldham’s characterization that the “resin may be introduced under vacuum” does not necessarily mean that the assembly itself is under vacuum during the introduction of the resin. As such, we are not persuaded that Oldham teaches “applying a flowable encapsulant to the assembly while maintaining the assembly under a subatmospheric pressure,” per claim 1, and dependent claims 2–5.

In response, Amkor cites Oldham’s claim 17, which modifies claim 15, detailing that “prior to said filling of step ‘f’, said chamber is evacuated to a pressure of about one millimeter of mercury or less and subsequently said filling occurs under said vacuum.” Reply 10 (citing Ex. 1003, 19:6–9). However, that recitation pertains to the chamber and not necessarily the assembly, per claim 1 of the ’076 Patent. Amkor also cites Oldham’s abstract as stating that “the mold cavity is evacuated to a subatmospheric pressure to impose a vacuum on the mold,” (Reply 10), but that statement comes *after* the statement that “the mold cavity is filled with a low viscosity

heat curable, thermosetting resin.” Thus, the vacuum would not be applied while “applying a flowable encapsulant,” per claim 1. Amkor also argues that Oldham is silent about degassing the resin, as implied by Dr. Goosey, (Reply 11), but we do not find this to be conclusive given the depth of discussion provided in Dr. Goosey’s testimony. Rather, we are persuaded that one of ordinary skill in the art would have considered that introducing resin under vacuum could have meant that the resin is degassed and maintained until it is applied. Ex. 2055 ¶ 176. As such, we are not persuaded, in view of all of the evidence of record, that Oldham necessarily teaches “applying a flowable encapsulant to the assembly while maintaining the assembly under a subatmospheric pressure,” per claim 1.

In addition, we have reviewed the deposition of Dr. Goosey (Ex. 1045) and can determine no point in which his testimony was shown to be faulty or unpersuasive with respect to his discussions relied upon above. Also, Amkor’s arguments in its Reply are unpersuasive for the reasons explained above, and Amkor did not cite its Reply any declarant testimony in rebuttal to Dr. Goosey’s testimony regarding the “applying” step. See Reply 9–11. Based on the instant record, we determine Dr. Goosey’s testimony to be uncontroverted.

Additionally, we accept that Amkor has asserted the anticipation ground over Oldham expressly, as opposed to Oldham inherently disclosing all of the elements of claims 1–5. At Oral Hearing, counsel for Amkor made it clear that it need not rely on inherency for Oldham to anticipate claim 1–5. Tr. 25–26. As such, we have considered what one of ordinary skill in the art

would have found Oldham to disclose, and it is not clear that Oldham teaches all of the elements of claims 1–5.⁵

We also note that the ground of unpatentability of claims 1–5 over Oldham was originally proffered by Amkor as being “under 35 U.S.C. § 102 or, in the alternative under 35 U.S.C. § 103.” Pet. 45; Dec. 6, n.2 (emphasis omitted). As we noted in our Decision, Amkor’s asserted ground does not provide any of the necessary analysis for obviousness, save conclusory statements, such as “the asserted claims would have been obvious” in light of the base reference “and the knowledge of one skilled in the art,” such that, we interpreted the ground as being proffered under 35 U.S.C. § 102 only. Dec. 6, n.2. As such, no consideration of the obviousness of claims 1–5 based on Oldham, alone or in combination with any other reference(s), has been made during the instant proceeding.

D. Remaining Grounds of Unpatentability

In addition to the above-discussed anticipation ground over Oldham, we also instituted on the following grounds:

⁵ The Dissent takes a different view of the disclosure of Oldham, but we accept that anticipation must be based on whether a single reference discloses all of the elements of a claim. Anticipation requires that every limitation of the claim at issue be disclosed in a prior art disclosure and “arranged or combined in the same way as recited in the claim.” *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008). “[I]t is not enough that the prior art reference . . . includes multiple, distinct teachings that the artisan might somehow combine to achieve the claimed invention.” *Id.*

Claims 6–8, 10–13, and 18 as unpatentable under 35 U.S.C.

§ 103 over Oldham and Kovac;

Claim 19 as unpatentable under 35 U.S.C. § 103 over Oldham
and Nakano; and

Claims 24 and 25 as anticipated under 35 U.S.C. § 102(b) by Hwang.

Dec. 34.

The analysis presented in Amkor’s Petition makes it clear that the first two obviousness grounds are dependent on the analysis with respect to claim 1 in the anticipation ground over Oldham, discussed above. Pet. 50–54, 56–57. The obviousness grounds applying Oldham do not discuss how the secondary references would cure the defect we find in the anticipation of claim 1 over Oldham. As such, we conclude that Amkor has not shown by a preponderance of the evidence that claims 6–8, 10–13, 18, and 19 are unpatentable, on the basis of those instituted grounds.

With respect to the anticipation ground of claims 24 and 25 over Hwang, Tessera has not countered the analysis provided in the Decision with respect to this ground. Dec. 32. We determined therein that Amkor had demonstrated a reasonable likelihood that it would prevail with respect to claims 24 and 25. *Id.* At oral hearing, Tessera’s counsel indicated that those claims covered embodiments “not used commercially,” and that Tessera did not want “to spend the Board’s resources or our resources fighting about something that’s not used.” Tr. 62. We have reviewed the evidence presented by Petitioner regarding claims 24 and 25 and determine that Petitioner has shown that the claims are unpatentable by a preponderance of

the evidence. *See* Pet. 59–60; Ex. 1008, 72–73; Ex. 1024, 3–5. As such, we conclude that Amkor has shown that claims 24 and 25 are unpatentable, on the basis of being anticipated by Hwang under 35 U.S.C. § 102(b).

E. Motion for Observation

Tessera filed a Motion for Observation (Paper 109) on the cross-examination of Drs. Michael Caloyannides and Alexander Glew, which took place after Amkor filed its Reply. Amkor filed a Response (Paper 118). We have considered Tessera’s observations and Amkor’s responses in rendering our decision.

III. CONCLUSION

We have considered the record before us in this *inter partes* review proceeding. We conclude that Amkor has shown by a preponderance of the evidence that claims 24 and 25 are unpatentable. We further conclude that Amkor has not shown by a preponderance of the evidence that claims 1–8, 10–13, 18, and 19 are unpatentable.

IV. ORDER

In consideration of the foregoing, it is
ORDERED that claims 24 and 25 of the ’076 Patent are held
unpatentable;

FURTHER ORDERED that claims 1–8, 10–13, 18, and 19 have not
been shown to be unpatentable;

FURTHER ORDERED that the terminal disclaimer filed by Patent Owner in U.S. Patent Application No. 08/975,590 (issued as the '076 Patent) on April 11, 2014, shall no longer be held in abeyance. *See* Paper 129; and

FURTHER ORDERED that because this is a final written decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

Certain materials have been sealed in this proceeding, but have not been relied upon in this final written decision. *See* Papers 31, 99. The record will be maintained undisturbed pending the outcome of any appeal taken from this decision. At the conclusion of any appeal proceeding, or if no appeal is taken, the materials will be made public. *See* Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,760-61 (Aug. 14, 2012).

Further, either party may file a motion to expunge the sealed materials from the record pursuant to 37 C.F.R. § 42.56. Any such motion will be decided after the conclusion of any appeal proceeding or the expiration of the time period for appealing.

DeFRANCO, *Administrative Patent Judge, joining-in-part and dissenting-in-part.*

I join the majority opinion holding that claims 24 and 25 of the '076 patent are unpatentable, but I respectfully dissent from the majority regarding the patentability of claims 1–8, 10–13, 18, and 19.

Claim 1, the independent claim at issue, recites a “method of encapsulating a microelectronic assembly” that includes the step of “*applying a flowable encapsulant while maintaining the assembly under a subatmospheric pressure.*” Ex. 1007, 14:29–32 (emphasis added). Simply put, this step requires that encapsulant be applied to the assembly while the assembly is under vacuum. According to the Specification of the '076 patent, applying the encapsulant in a vacuum environment is important “so that the encapsulant flows into the gap” defined between the microelectronic element (e.g., a semiconductor chip) and the underlying substrate of the assembly. *Id.* at 3:1–17, Fig. 1; *see also id.* at 5:62–67 (“The vacuum environment . . . causes the encapsulant 200 to flow under the chip between the chip and the substrate by capillary action”). The Specification explains that “interpos[ing] encapsulant material between and/or around elements” of the assembly reduces “the strain and stress on the connections” between the chip and the underlying substrate. *Id.* at 1:17–23.

Like the '076 patent, Oldham describes a “method of encapsulating electrical components to provide increased resistance to electrical stress.” Ex. 1003, 1:11–14. In particular, claim 15 of Oldham’s disclosure illustrates an embodiment comprising the steps of:

- (a) providing a rigid mold having a cavity therein . . . ;
- (b) providing a chamber for containing said mold and for . . .
varying pressures to said cavity of said mold; . . .
- (d) loading the component in said cavity of said mold;
- (e) loading said mold containing said component into said
heated chamber;
- (f) filling the mold cavity with . . . resin . . . ;
- (g) *evacuating the mold cavity to a subatmospheric pressure*
. . . to impose a vacuum on the mold to thereby impregnate the
component with the resin

Id. at 18:28–50 (emphases added). Oldham’s disclosure of *impregnating* the electrical component with resin while imposing a vacuum on the component within the mold cavity satisfies the claimed step of “applying a flowable encapsulant to the assembly” while maintaining the assembly under vacuum.

Central to the majority’s analysis is its finding that Oldham fails to disclose that “the assembly itself is under vacuum during the *introduction* of the resin.” Final Dec. 10 (emphasis added). But claim 1 does not say “introducing” the resin under vacuum, it says “applying” the resin “to the assembly” while under vacuum. As disclosed in Oldham, the application of resin to the electrical component occurs in step (g) of claim 15, when the vacuum is imposed on the mold cavity “to thereby *impregnate the component with resin.*” Ex. 1003, 18:45–49. That Oldham’s component is under vacuum during application, i.e., impregnation, of the resin is made clear by the express reference in step (b) of claim 15 to “varying pressures *to said cavity of said mold*” and in step (g) to “evacuating *the mold cavity* to a

subatmospheric pressure.” *Id.* at 18:33–46 (emphasis added). Once the mold cavity, which holds the component, is evacuated, the vacuum within the cavity causes the resin to thereby “impregnate,” i.e., be applied, to the component. *Id.* at 18:45–49. Thus, contrary to the majority’s finding, Oldham’s claim 15 evinces an encapsulation process where the electrical component is under vacuum during application of the resin into the component.

Moreover, Example 6 of Oldham reiterates that the vacuum is “maintained on the assembly” during application of the resin. Ex. 1003, 15:50–16:23. As described in Example 6, the resin was “metered under vacuum into the mold containing the coil [assembly]. A *vacuum* . . . was applied to the mold and *maintained on the assembly* for 2 minutes to impregnate the coil . . . in the mold.” *Id.* at 16:8–13 (emphasis added). Further evidence includes Oldham’s disclosure that the mold containing the electrical component “acts as *the vacuum pressure chamber*, with pressurization being produced *on the mold contents*.” *Id.* at 8:35–40; see also *id.* at 3:18–26 (“providing a rigid mold having a cavity and . . . varying pressure *to the mold contents*”) (emphasis added). Those disclosures make clear that Oldham’s electrical component, contained within the mold cavity, is under vacuum during application of the resin. On that basis, I would conclude that one of ordinary skill in the art, reviewing Oldham’s disclosure in claim 15 of “evacuating the mold cavity to a subatmospheric pressure . . . to impose a vacuum on the mold” for “impregnat[ing] the component with resin,” would understand it to be the same as “applying a flowable

encapsulant to the assembly while maintaining the assembly under a subatmospheric pressure,” as called for by claim 1.

The majority errs by focusing on a single statement in Oldham to the exclusion of Oldham’s disclosure as a whole. Pointing to Oldham’s statement that “the resin may be introduced under vacuum,” the majority draws the conclusion that, although Oldham may “introduce” the resin under vacuum, “the article [i.e., component] within the mold is not maintained under vacuum.” Final Dec. 9 (citing Ex. 2055 ¶¶ 173–217). The majority’s analysis, however, suffers from the limited perspective of what happens during Oldham’s introduction of resin into the mold, i.e., the initial step of “filling” the mold. *See id.* at 9–10. But, as discussed above, the more relevant focus is on step (g) of Oldham’s claim 15, which pertains specifically to applying the resin “to the component” while under “vacuum.”

The majority’s limited view of Oldham may stem from a narrow reading of the claim term “applying.” The plain and ordinary meaning of “applying” is “to lay or spread on.”¹ Consistent with *spreading* the resin over the electronic component, the Specification of the ’076 patent states that:

The step of applying the encapsulant may include the step of applying the encapsulant along one or more edges of the microelectronic element *so that the encapsulant flows into the gap . . . while the assembly is under the subatmospheric pressure.*

¹ *Merriam-Webster’s Collegiate Dictionary*, 56 (10th ed. 2000).

Ex. 1007, 3:5–9 (emphasis added).² Additional passages in the Specification provide that: “the encapsulant *flows into the porous layer* while the assembly is under the subatmospheric pressure” (*id.* at 3:10–12), and “[t]he vacuum environment . . . causes the encapsulant 200 to *flow under the chip* between the chip and the substrate by capillary action” (*id.* at 5:62–67) (emphasis added). Those descriptions of applying the encapsulant to flow into and around the assembly while “under subatmospheric pressure” reasonably indicate that the claimed “applying” step pertains to *spreading* the encapsulant over the assembly, not simply introducing the resin into the mold, as the majority opines.

By narrowly construing the claimed “applying” step as encompassing only “introducing” or “filling” resin in the mold, the majority overlooks the pertinent disclosure in Oldham in which the resin is *spread* into the component, i.e., step (g) of claim 15, which describes application of the resin in terms of “impregnat[ing] the component with the resin” while “impos[ing] a vacuum” on the mold and the component therein. That oversight amounts to error in the majority’s anticipation analysis of Oldham. Further, the majority’s reliance on Dr. Goosey’s testimony (Final Dec. 9–10) is of no assistance because, like the majority, Dr. Goosey never addresses step (g) of Oldham’s claim 15.

² Dependent claim 6, which depends directly from claim 1, likewise defines the step of “applying said encapsulant.” Ex. 1007, 14:49–56.

In any event, even if the claimed “applying” step is limited to when Oldham introduces the resin into the mold (i.e., Oldham’s “filling” step), the evidence still does not support the majority’s finding because Oldham discloses a *modified* embodiment in claim 17, in which the vacuum is imposed on the mold cavity “prior to” the filling step so that “filling occurs under said vacuum.” Ex. 1003, 19:6–9. Taken together, claims 15 and 17 therefore disclose an embodiment in which the mold cavity, and the component therein, are under vacuum while the resin is being introduced into the mold. *Id.* at 18:28–49, 19:6–9.³

To the extent the majority infers that claim 17’s reference to the “chamber” being under vacuum does “not necessarily” mean the component is under vacuum (see Final Dec. 10), Oldham makes clear that the mold “acts as the *vacuum pressure chamber*, with pressurization being produced *on the mold contents*.” Ex. 1003, 8:35–40 (emphasis added). That disclosure confirms that the vacuum produced in Oldham’s “chamber” is translated to the *contents of the mold*, namely, the electrical component. Dr. Goosey, on whose testimony the majority relies, never addresses Oldham’s embodiment as modified by claim 17. See Final Dec. 9–10. Thus, on this record, there is

³ Citing *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359 (Fed. Cir. 2008), the majority infers that Oldham’s disclosure involves “multiple, distinct teachings” that cannot be combined to achieve the claimed invention. Final Dec. 12 n.5. But Oldham’s claim 15 is directed to a single embodiment, not multiple, distinct embodiments. Likewise, Oldham’s claim 17, which depends directly from claim 15, involves a single embodiment. That claim 17 incorporates, as a matter of law, the steps of claim 15 does not make it an improper combination of different embodiments.

no evidence to support the majority's view that Oldham's claim 17 embodiment lacks a vacuum on the component itself. In contrast, Oldham expressly evinces that encapsulation of the component takes place in a *vacuum chamber*.⁴ On that basis, I would conclude that Oldham's claim 17 discloses an embodiment where the electrical component sitting within the mold chamber is under vacuum during both introduction of the resin into the mold and application of the resin into the component, thereby satisfying the claimed "applying" step of claim 1.

The majority does not find that Oldham lacks any other limitation of claim 1, or any of the limitations of dependent claims 2–5, and the evidence confirms that such limitations are disclosed expressly by Oldham. *See* Pet. 45–50. Thus, because the record supports a finding that Oldham discloses, and thus anticipates, the subject matter of claim 1–5, including the step of applying encapsulant to the assembly while maintaining the assembly under vacuum, I respectfully dissent from the majority opinion.

Further, because the majority's determination of non-obviousness of dependent claims 6–8, 10–13, 18, and 19 is based entirely on its finding that Oldham lacks the "applying" step of independent claim 1, the majority's error in its anticipation analysis undermines its non-obviousness determination. Thus, I respectfully dissent from the majority's determination that dependent claims 6–8, 10–13, 18, and 19 are patentable.

⁴ Like Oldham, the Specification of the '076 patent speaks of the encapsulation process as occurring "within the vacuum chamber 220." *See, e.g.*, Ex. 1007, 5:28–44.

IPR2013-00242
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