

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Chongqing Yanmei Technology Co., LTD,

Petitioner,

v.

Terves, LLC,

Patent Owner.

IPR2023-00521
U.S. Patent No. 10,689,740

**PATENT OWNER'S SUR-REPLY
TO REPLY TO PETITION**

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Other Authorities

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EXHIBIT LIST

Exhibit	Description
2001	Declaration of Mark Cohen
2002	Cohen Resume
2003	EO13817
2004	EO13953
2005	EO14017
2006	Komesaroff, Make the Foreign Serve China
2007	Declaration of Andrew Sherman
2008	Disclaimer in Patent under 37 CFR 1.321(a)
2009	Electronic Acknowledgement Receipt of Ex. 2008.
2010	<i>Terves, LLC v. Yueyang Aerospace New Materials Co. Ltd. et al.</i> , Case No. 1:19-cv-1611 (N.D. Oh.), ECF 134, Terves Motion for Summary Judgment
2011	<i>Terves, LLC v. Yueyang Aerospace New Materials Co. Ltd. et al.</i> , Case No. 1:19-cv-1611 (N.D. Oh.), ECF 134-21, Ecometal Invalidity Contentions
2012	<i>Terves, LLC v. Yueyang Aerospace New Materials Co. Ltd. et al.</i> , Case No. 1:19-cv-1611 (N.D. Oh.), ECF 144, Defendants Response to Motion for Summary Judgment
2013	<i>Terves, LLC v. Yueyang Aerospace New Materials Co. Ltd. et al.</i> , Case No. 1:19-cv-1611 (N.D. Oh.), ECF 178, Summary Judgement Order
2014	<i>Terves, LLC v. Yueyang Aerospace New Materials Co. Ltd. et al.</i> , Case No. 1:19-cv-1611 (N.D. Oh.), ECF 203, Judgment.
2015	<i>Terves, LLC v. Yueyang Aerospace New Materials Co. Ltd. et al.</i> , Case No. 1:19-cv-1611 (N.D. Oh.), ECF 219, Permanent Injunction Memorandum Opinion
2016	<i>Terves, LLC v. Yueyang Aerospace New Materials Co. Ltd. et al.</i> , Case No. 1:19-cv-1611 (N.D. Oh.), ECF 220, Permanent Injunction
2017	Medlin Declaration during Reexamination
2018	Swanger Declaration during Reexamination
2019	Redline from '653 patent to '740 patent
2020	Application Data Sheet for '740 patent
2021	Specification for '740 patent
2022	IDS for '740 patent
2023	IDS signed for '740 patent

Exhibit	Description
2024	IDS signed (second time) for '740 patent
2025	First Amendment for Ex Parte Reexamination
2026	'740 patent application as originally filed
2027	'838 Doud patent application as originally filed
2028	'838 Doud provisional application as originally filed
2029	Petitioner request for deposition and related correspondence
2030	Petitioner notice of deposition

I. INTRODUCTION

Terves submitted a Response (Paper 18). Petitioner submitted a Reply to the response (Paper 25) that Terves now submits this Sur-Reply.

The Board determined that claims 76-81 were entitled to the benefit of the filing date of Doud and Doud is not prior art to these claims. Paper 14 at 13. The Board also was not persuaded that Xu or Xiao in view of Xu rendered the claims unpatentable. Paper 14 at 20, 24-25.

Consistent with the Board's determination and to expedite the IPR, Terves amended the claims in its contingent Motion to Amend to include the ranges for the additive material based on claims 76-81. Paper 19. To the extent the Board does not grant the Motion to Amend, original claims 76-81 remain patentable.

Petitioner's Reply does not establish how the evidence in its Petition meets its burden of proof in finding claims 76-81 are unpatentable. Facing the Board's prior finding of patentability, Petitioner makes new, improper written description objections, which it is prohibited from raising for the first time in a reply or for that matter in this proceeding, and are not compelling.

For priority, Petitioner makes new arguments about the lack of support in Doud, which contradict Petitioner's prior arguments and evidence in its Petition and in its expert declaration. The new arguments further misconstrue the standard for written description support and impute claim limitations not actually recited in the

claims, which the Board should reject as an improper strawman argument. For obviousness, Petitioner continues to fail to actually provide any evidence or support for its baseless statements against Xu or Xiao in view of Xu.

For all these reasons, the Board should find that claims 76-81 are patentable.

II. PETITIONER HAS NOT MET ITS BURDEN OF PROOF

In an IPR, “the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016). That burden **never shifts** to the patent owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). While the Board has instituted an IPR, the Federal Circuit has explained petitioner has a higher burden to win the proceeding at trial:

[T]here is a significant difference between a petitioner’s burden to establish a ‘reasonable likelihood of success’ at institution, and actually proving invalidity by a preponderance of the evidence at trial. *Compare* 35 U.S.C. §314(a) (standard for institution of *inter partes* review), with 35 U.S.C. §316(e) (burden of proving invalidity during *inter partes* review).

Trivascular, Inc. v. Samuels, 812 F.3d 1056, 1068 (Fed. Cir. 2016). Petitioner has not met its burden and claims 76-81 remain patentable.

III. “QUESTIONABLE SCOPE” ARGUMENTS ARE MERITLESS

Petitioner, improperly and for the first time, makes several arguments that original claims 76-81 have “questionable scope.” Paper 25 at 3-7. Not only are such new arguments not permissible in a reply, but the arguments are also not permissible

in an IPR as they are not §§ 102 or 103 arguments. The arguments also are substantively illogical and Petitioner has not shown a POSITA would not be able to readily ascertain the scope of the claims. Indeed, Petitioner's expert did not opine on any of these issues that Petitioner now raises for the first time by argument in reply. For each of these reasons, Petitioner's arguments fail.

A. Petitioner cannot submit new arguments in its Reply

Generally, petitioners “may not submit new evidence or argument in reply that it could have presented earlier, e.g., to make out a prima facie case of unpatentability.” U.S. PTAB, Consolidated Trial Practice Guide 73 (Nov. 2019).

Petitioner did not make any such arguments in its Petition that: (1) “it is unclear how much magnesium is needed before a composite is considered a dissolvable magnesium cast composite,” or (2) the “range of additives provided in claims 80-81 exceeds the scope of the additives implied by a parent claim.” Paper 25 at 4-7. These new arguments are not related to Petitioner's arguments in its Petition nor to Patent Owner's arguments in its Response. The Board should reject these new reply arguments.

B. Written description objections are not permitted in an IPR

Moreover, challenges in IPR can only be based upon “a ground that could be raised under §§ 102 or 103, and only on the basis of prior art consisting of patents or printed publications.” 35 U.S.C. § 311(b). Petitioner appears to acknowledge this

restriction in an IPR and alleges that Petitioner is not asking the Board to cancel the claims on a § 112 basis. Yet, the Petitioner proceeds to make exactly a § 112 argument. Petitioner argues that it “wishes to simply point out that these claims 76-81 have questionable scope and this affects a crucial question ... whether there is support for the full scope of the claimed range limitations of claims 76-81 in the specification of the parent.” Paper 25 at 4. But Petitioner’s arguments do not actually relate to whether the claims are supported in Doud and do not cite to or refer to Doud’s specification in even one instance. Paper 25 at 4-7.

Instead, Petitioner’s arguments relate to definiteness and clarity. In fact, for its arguments related to amount of magnesium, Petitioner makes the same arguments in its Opposition to the motion to amend for proposed claims 104 and most of its dependents (corresponding to original claim 19 and its dependents) under the heading: “the terms “dissolvable magnesium cast composite” and “magnesium composite” **are indefinite** under 35 USC 112(b).” Emphasis added. Paper 24 at iii; 4-6. Similarly, for its arguments related to ranges of additives, Petitioner makes the same arguments in its Opposition to the motion to amend for proposed claims 162-163 (corresponding to original claims 80-81) under the heading: “Claims 162 and 163 **are indefinite** under 35 U.S.C. § 112(b) and/or fail to further limit the parent claim as required under 35 U.S.C. § 112(d).” Emphasis added. Paper 24 at iii; 11-

12. Petitioner concludes both arguments in this Reply by re-iterating “it is not clear” Emphasis added. Paper 25 at 6-7. For these reasons, the arguments fail.

C. Petitioner’s arguments run afoul of established law

Finally, Petitioner’s scope arguments are substantively illogical and not consistent with established the law. For one, Petitioner imputes requirements to the claims that do not exist. A POSITA would be able to understand both the amount of magnesium present as well as the amounts of corresponding additives in embodiments covered by the claims. Petitioner has not shown from its own expert that a POSITA would not be able to readily ascertain the scope of the claims. Indeed, Petitioner’s expert made no such arguments. Ex. 1016.

Indefiniteness is “evaluated from the perspective of a person with ordinary skill in the relevant art at the time of the invention.” *Nautilus, Inc. v. Biosig, Insts., Inc.*, 134 S. Ct. 2120, 2128 (2014). Claims are given their plain meaning and understood in light of the specification. MPEP § 2111. Applicants have considerable latitude in how they choose to define the invention so long as the terms and phrases define the invention with a reasonable degree of clarity and precision. *Ex Parte Peter M. Jacobson*, APPEAL 2013-001502 at *3 (PTAB May 22, 2015).

- i. *A POSITA would understand the terms “dissolvable magnesium cast composite” or “magnesium composite”*

Petitioner argues it is unclear “what concentration of magnesium is required ... to be considered a “dissolvable magnesium cast composite” or “magnesium

composite.” Paper 25 at 5. As stated, Petitioner makes the same argument to proposed claims 104 and most of its dependents (corresponding to original claim 19 and its dependents) in its Opposition to the motion to amend as amounting to indefiniteness of the claims. Petitioner argues “[t]he term “magnesium cast composite” or “magnesium composite” *could* mean that the composite material is over 50% magnesium.” Emphasis added. Paper 25 at 5. To the extent Petitioner wants to read this limitation into the term “magnesium composite,” it is conjecture.

To supposedly counter its conjecture, Petitioner argues the specification is unclear describing “[n]on-limiting magnesium composites in accordance with the present invention include at least 50 wt. % magnesium.” Paper 25 at 5. As claims must be read in light of the specification under MPEP § 2111, Petitioner answered its own question by its citation. The ‘740 Patent discloses embodiments where magnesium is present in at least 50 wt. % magnesium and embodiments where it is not. Petitioner further answered its question by noting that dependent claims 27- 28 recite the magnesium is present in at least 50 wt. %, which indicates the independent claim does not require this limitation. The plain language of claim 19 is also clear: the claimed magnesium composite comprises “a mixture of magnesium or a magnesium alloy and an additive material” and magnesium is not limited to a specific wt. % range.

Petitioner argues there is no “lower limit of magnesium concentration,” but Petitioner does not cite to any requirement in patent law for claims to specify exact ranges for every component. Indeed, no requirement exists. Moreover, the claims do recite several wt. % ranges for other components (e.g., for additive materials) from which a POSITA would be able to deduce amounts of magnesium covered by the claims. Petitioner’s own expert did not raise this problem in his evaluation of the claims. Ex. 1016. Overall, anything that falls within the limitations of the claims is a “dissolvable magnesium cast composite” or “magnesium composite” and Petitioner has not provided any support to prove that these terms require more than the presence of “a mixture of magnesium or a magnesium alloy” as recited in claim 19.

Petitioner argues “[s]o if all the additive metals were present in their maximum concentrations, then there would be 90% additives (35% + 35+ 20%), which suggests that claim 76 literally covers a composite with a 10 wt. % magnesium.” Paper 25 at 6. Petitioner does not explain why this is a problem, however, or why this could not be described as a “magnesium” composite. The fact is that all embodiments covered by claim 19 comprise “a mixture of magnesium or a magnesium alloy and an additive material” whereas the type of additive materials can vary. Just because embodiments may have less than 50 wt. % magnesium does not make them any less of a “magnesium” composite as would be understood by a POSITA. Even Petitioner’s own expert had no difficulty understanding

embodiments of a “magnesium composite” where the copper, nickel, or cobalt are present in amounts up to and including 35 wt. %. Ex. 1016 at ¶¶ 41, 42, 44.

Petitioner has not provided any support to prove a POSITA would not readily understand the scope and meaning of a “magnesium” composite in view of the claims and specification.

ii. *A POSITA would understand the recited wt. % ranges for additive materials*

Petitioner argues claims 80-81 are unclear because depending claims 27-28 recite at least 50 wt. % magnesium and claims 80-81 recite ranges for additive materials with ranges that could cumulatively add to more than 50%. As stated, Petitioner makes the same argument to proposed claims 162-163 (corresponding to original claims 80-81) in its Opposition to the motion to amend as amounting to indefiniteness of the claims. In any case, both arguments fail for the same reasons: there is no requirement that the maximums for all components add to exactly 100% and a POSITA would be able to ascertain the scope of the claims.

In *Ex Parte Sophie Viala*, the Board concluded that while “claim 37 may read on a composition including more than 100% by weight of the recited components,” this does not render the claim indefinite, “[r]ather, we determine that an ordinarily skilled artisan reading claim 37 could readily ascertain whether vinylpyrrolidone, acrylic acid, and pentaerythritol triallyl ether were present in a composition within the recited ranges, and thus whether the composition was within the scope of claim

37.” *Ex Parte Sophie Viala, Andreas Clausen, Celina Storbeck, Mirko Tesch, & Kerstin Skubsch*, APPEAL 2014-001627, at *2 (PTAB Oct. 20, 2016). Such ruling aligned with prior precedent finding that “we cannot ... sustain the examiner’s rejection of the claims as ‘reading on’ compositions containing more than 100% [b]y weight of the components. Clearly, a rejection based on indefiniteness cannot stand simply because the proportions actually recited in the claims may be read in theory to include compositions that are impossible in fact to formulate. *In re Kroekel*, 504 F.2d 1143, 1146 (CCPA 1974).

Here, as in *Ex Parte Sophie Viala* and *In re Kroekel*, just because the claims recite ranges where the maximums may cumulatively amount to over 100% does not render the claims unclear. A POSITA would be able to understand whether a composition is within the scope of the claims. A POSITA would be able to deduce amounts of magnesium and amounts of metal materials covered by the claims. Moreover, Petitioner does not cite to, and there does not exist, any requirement that maximum percentages in a claim have to equal exactly 100%.

Notably, claims 80-81 recite “wherein said additive material includes one or more metal materials selected from the group consisting of 0.1-35 wt. % copper, 0.1-24.5 wt. % nickel and 0.1-20 wt. % cobalt.” Within these ranges are a myriad of combinations that add up to 50 wt. % and which would be consistent with the depending claims specifying “wherein said magnesium composite includes at least

50 wt. % magnesium.” Moreover, each of the maximums themselves, e.g., embodiments that do only include one of copper, nickel, or cobalt, are less than 50 wt. %. Petitioner’s own expert also did not raise any arguments that the recited percentages in these claims are unclear. Ex. 1016.

Therefore, there is no requirement that the maximums for all components add to exactly 100% and a POSITA would be able to ascertain the scope of the claims.

IV. PETITIONER ARGUMENTS TO DOUD

Petitioner argues that claims 76-81 are not supported in the parent application and are not entitled to the earliest priority of Doud because:

Although there might be written description support for the *individual ranges* having a maximum value of 35 wt. % of Cu or Ni and 20 wt. % of Co in the disclosure of the parent ‘653 patent application, there is no support for the combination of *more additives than one* as presently claimed in claim 76-81 because the combination of the *more additives than one* at their upper range values would exceed the scope of the written description support provided for the additives in the 653 patent.

Emphasis original. Paper 25 at 9.

These arguments, however, are again impermissible as they are newly presented in Petitioner’s Reply and were also not raised by Petitioner’s expert. Further, Petitioner improperly relies on a heightened standard for written description support and fails to recognize that all limitations in the claims are clearly supported in the parent applications. Petitioner instead imputes claim limitations into claims 76-81 that are

not actually recited in the claims and argues that these imputed claim limitations are not supported in the patent application (even though they are by implication).

For these reasons, Petitioner has failed to prove claims 76-81 are not supported in Doud and entitled to the benefit of the earliest priority date.

A. Petitioner cannot submit new arguments in its Reply

As noted, petitioners “may not submit new evidence or argument in reply that it could have presented earlier, e.g., to make out a prima facie case of unpatentability.” U.S. PTAB, Consolidated Trial Practice Guide 73 (Nov. 2019). Petitioner did not make any such arguments in its Petition that: (1) “there is no support for the combination of more additives than one,” or (2) “the combination of the more additives than one at their upper range values would exceed the scope of the written description support provided for the additives.” Paper 25 at 9. The Board also recognized that “Petitioner does not make any specific lack of written description arguments with respect to dependent claims 76–81.” Paper 14 at 13. So Petitioner should not be permitted to make new written description arguments against claims 76-81 now. The Board should reject these new reply arguments.

B. Petitioner misconstrues standard for written description support

Petitioner acknowledges that claims 76-81 find “written description support for the individual ranges having a maximum value of 35 wt. % of Cu or Ni and 20 wt. % of Co in the disclosure of the parent ‘653 patent application.” Paper 25 at 9.

Petitioner, however, argues that the ‘653 Patent does not support the combination of “more additives than one.” Paper 25 at 9.

To satisfy the written description requirement of 35 U.S.C. §112(a), the description “must clearly allow [a POSITA] to recognize that [the inventor] invented what is claimed.” *Ariad Pharm., Inc. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc) (citing *Vas-Cath Inc. v. Mahurkar*, 935 F.2d 1555, 1562–63 (Fed. Cir. 1991)). The test for written description support is whether the disclosure “conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *Id.* “[T]he test requires an objective inquiry into the four corners of the specification.” *Id.*

The ‘653 Patent, in fact, does provide explicit support for more additives than one. For example, the abstract describes “One or more additives are added to the metallic primary alloy” Ex. 1002 at Abstract. Further, the ‘653 Patent twice states: “One or more additives are added to a magnesium or magnesium alloy to form the novel magnesium composite of the present invention.” Ex. 1002 at 2;22-24 and 15;64-66. For these reasons, the Petitioner’s arguments fail.

C. Petitioner imputes claim limitations not recited in the claims

Petitioner appears to add the maximum weight percentages of each range for the one or more metals recited in the claims and then proceeds to argue that the ‘653 Patent does not disclose “concentration of additives over 50%, or that the

concentration of additives covers a range between 35-50%, or that the concentration of additives is between 45 wt. % and 49.5 wt. %, or between 45 wt. % and 50 wt. %, when the additives are limited to one or more of Cu, Ni, or Co.” Paper 25 at 10. These limitations, however, are not actually recited in any of claims 76-81, so Petitioner’s arguments are not relevant to the actual claim language.

Moreover, the ‘653 Patent does disclose each range for copper, nickel, and cobalt explicitly, as admitted by Petitioner and Petitioner’s expert, and the ‘653 Patent does disclose that “One or more additives are added to a magnesium or magnesium alloy to form the novel magnesium composite of the present invention.” Ex. 1002 at 2;22-24 and 15;64-66. As a result, all of the limitations recited in the claims are fully supported in the ‘653 Patent and in Doud. Further, a POSITA would be able to understand the scope of the claims and recited ranges for wt. % in view of the specification. Petitioner’s expert had no difficulty understanding embodiments where the copper, nickel, or cobalt are present in the amounts recited. Ex. 1016 at ¶¶ 41, 42, 44. Therefore the actual recitations in claims 76-81 are clearly supported in the ‘653 Patent and Doud.

D. Board found claims 76-81 are supported in Doud

Since claims 76-81 recite closed ranges of additive materials, the Board found the claims have written description support in Doud, are entitled to the earliest priority date of Doud, and that Doud is not prior art.:

As there appears to be no dispute that Doud provides written description support for the recited levels of copper, nickel, and cobalt in claims 76–81, and the claims may not literally read on a composition having levels of copper, nickel, and cobalt that are outside the recited ranges, we determine that these claims are entitled to the benefit of the filing date of Doud. As such, we do not apply Doud as prior art to claims 76–81.

Paper 14 at 15.

Notably, both Petitioner and Petitioner's expert admit that these ranges upper limits are "literally" supported by Doud. Pet. 22-24; Ex. 1016 ¶¶41-42; *see also* Pet. 39-40 (citing Doud ¶¶ [0045], [0046], [0053], [0047], [0014], [0015], [0019]-[0022]). Indeed, Petitioner's own expert explains:

40. In claim 19, the concentration weight percentages for copper, nickel, and cobalt are recited as being "at least 0.01 wt% ... "

41. I have carefully reviewed the disclosure of the '653 patent. **The upper range boundary disclosed** for copper is 35 weight%. '653 patent col. 5 line 16. **The upper range** for nickel is 35 weight%. '653 patent col. 4 lines 58. **And the upper range** boundary for cobalt is 20 weight%. See '653 col. 5 line 41.

Ex. 1016 ¶¶40-41 (emphasis added). Petitioner's expert continues:

44. So in my opinion, **to the extent that claim 19 covers** embodiments of a magnesium composite where the copper, nickel, or cobalt are present in **amounts over 35 weight %**, these embodiments are **not disclosed** in the disclosure of the '653 patent.

Ex. 1016 ¶ 44 (emphasis added).

The necessary corollary to Petitioner's expert's opinion in ¶44, is that Doud fully supports values up to and including 35%. Because claims 76-81 include an upper boundary for the ranges that fall within the ranges admitted by the Petitioner

and its expert as supported in Doud, Petitioner has not met—and cannot meet—its burden to show that these claims are not supported in Doud. Therefore, Petitioner fails to meet its burden of establishing that Doud is prior art, and therefore, Doud cannot anticipate Claims 76-81.

V. PETITIONER ARGUMENTS FOR XU

Petitioner argues that Xu teaches a magnesium cast composite and the recited dissolution rate and conditions, and cites its expert, but its expert does not actually make these claims and Petitioner has only presented unsupported arguments. The fact is that Xu teaches against a **cast** composite and a POSITA would not have been lead to modify Xu to provide wither a cast composite nor the recited dissolution rates and conditions. Each of these reasons alone, Petitioner failed to prove that Xu renders the claims unpatentable.

A. Xu teaches away from a magnesium cast composite

Petitioner alleges that Xu teaches a magnesium cast composite and cites to ¶¶ 50-55 of its expert declaration as support. Petitioner’s expert, however, does not actually use the word “cast” at all in its evaluation of Xu and did not state that Xu teaches a magnesium cast composite as the Petitioner implies. Instead, Petitioner’s expert states that Xu teaches a “dissolvable magnesium alloy composite” and improperly concludes that Xu reads on the claims without actually addressing each limitation of the claims. Ex. 1016 ¶¶ 52; 50-55. Perhaps this is why the Petitioner

did not quote its expert declaration in its Reply, but instead broadly cites to the only five paragraphs that the expert refers to Xu. Paper 25 at 13.

As previously argued, claim 19, and thus claims 76-81, *repeatedly* recite a “dissolvable magnesium cast composite” numerous time throughout the claims. The Board acknowledged that this term “is limiting.” Paper 14 at 20. Petitioner does not argue otherwise. Xu instead teaches a powder compact metal composite having a cellular nanomatrix and a metal matrix. Ex. 1007 at [0031].

Petitioner argues that “[i]n the same passage in paragraph [0059] in Xu where the patent owner believes Xu teaches away [forming a cast], Xu also suggests against ‘metallurgically processing a powder.’” Paper 25 at 13. But Xu teaching against metallurgically processing a powder, has no bearing on Xu also failing to disclose and instead teaching against forming a cast. In fact, that Petitioner recognizes Xu teaching against metallurgically processing a powder indicates that Petitioner must also recognize Xu teaching against casting from a melt. Specifically, Xu discloses:

“metal alloys (formed by, e.g., casting from a melt or formed by metallurgically processing a powder) without the cellular nanomatrix also do not have the selectively tailorable material and chemical properties as the metal composites herein.”

Ex. 1007 at ¶ [0059].

Petitioner argues that the “operative statement in paragraph [0059] is the ‘without the cellular nanomatrix’ and a person having ordinary skill would have been able to extend the teachings of Xu ‘185 from sintering or forging to a casting

process.” Paper 25 at 14. As shown in the above excerpt, however, this statement is preceded by the example of “casting from a melt” and followed by the perceived shortcomings of this process in not having “the selectively tailorable material and chemical properties as the metal composites herein.” Ex. 1007 at ¶ [0059]. Having understood Xu to teach against a cast composite, a POSITA would not have been lead to modify Xu to provide a cast composite.¹ Petitioner has provided no support that a POSITA would have been lead to modify this specific teaching in Xu and Petitioner’s expert made no such claim.

The Board agreed:

Petitioner’s only support for a disclosure of ‘a magnesium cast composite’ in this ground is its citation to paragraph 59 of Xu. Pet. 55. Paragraph 59, however, appears to specifically distinguish Xu’s compacted powder compositions from metal alloys that are formed by casting from a melt. Ex. 1007 ¶ 59. Thus, on this record, Patent Owner appears to have a strong argument that Xu does not in fact teach or suggest a ‘cast composite’ containing the constituents recited in claim 19. Prelim. Resp. 44–45.

Paper 14 at 19-20; *see also id.* at 20 (“Patent Owner also raises a significant question as to whether one of ordinary skill in the art looking to form a magnesium cast composite would look to the disclosures of Xu, which specifically differentiates the

¹ Petitioner cites to U.S. Patent No. 9,759,035 to Fripp et al. as providing an example of a PHOSITA being discussing casting, but provides no support to show a PHOSITA would have a motivation to combine Fripp with Xu.

properties of its compacted powder products from cast magnesium composites that lack a nanomatrix”).

For this reason alone, Petitioner failed to prove that Xu renders the claims unpatentable.

B. Xu does not teach the claimed dissolution rate and conditions

Petitioner alleges the claimed dissolution rate is met by Xu because the dissolution rate “may in fact be present even if a reference disclosing the material is silent as to the property” and cites to ¶¶ 50-55 of its expert declaration as support. Paper 25 at 14. Petitioner’s expert, however, does not actually say the claimed dissolution rate and conditions would be present in any one of the myriad of embodiments that Xu discloses. 1016 ¶¶ 50-55. Instead, Petitioner’s expert makes the blanket statement that “I have concluded that there is nothing special about the...dissolution rate values versus what is disclosed in Xu” with no other reasoning for this conclusion. Ex. 1016 ¶¶ 54.

Petitioner has provided no actual evidence to support Xu discloses the claimed dissolution rate and conditions except that they “may be present” and “aren’t special.” This falls very short of Petitioner’s burden to show unpatentability. Petitioner argues that “Patent owner has failed to provide any evidence [to] show that the property would not be met by the prior art.” Paper 25 at 15. But this is not

Terves' burden and Terves did provide substantial reasoning for why Xu does not disclose the claim limitations. Petitioner just failed to respond to this reasoning.

As previously argued, claim 19 recites a dissolution rate and conditions not found in Xu. Xu teaches literally dozens of different potential salts or acids to dissolve the powder composite and expresses desirability of using an acid in a 56 wt. % CaCl_2 water mixture. Ex. 1007 ¶¶ [0052]-[0053]. Petitioner and its expert provide no explanation of how it would have been obvious to a POSITA to modify the 56 wt. % teaching in Xu for CaCl_2 and use instead use 3 wt. % KCl. Likewise, Petitioner does not address the fact that Xu discloses incredibly high dissolution temperatures of 800°, 1000°, or 1200° F, to achieve dissolution rates of 50-500 $\text{mg}/\text{cm}^2\text{-hr}$ when the claims recite a much lower temperature of 90° C (or 194° F). Petitioner and its expert also do not actually show or argue that using these conditions would actually result in the claimed dissolution rate for any of the embodiments disclosed in Xu.

The Board previously found these arguments persuasive:

With respect to dissolution rates, Patent Owner raises a significant question as to whether one of ordinary skill in the art would have understood from the various broad ranges disclosed in Xu that any particular composite of Xu could achieve the claimed dissolution rate in 3 wt. % KCl brine at 90° C.

Paper 14 at 20.

For this reason alone, Petitioner failed to prove that Xu renders the claims unpatentable.

VI. PETITIONER ARGUMENTS FOR XIAO IN VIEW OF XU

Petitioner argues that its expert declaration supports the conclusion that a POSITA would have combined Xiao and Xu because its expert states “providing for a plurality of additive precipitate particles” in Xiao would “achieve the predictable result of strengthening the metal composite of Xiao.” Paper 25 at 15; Ex. 1016 ¶ 77. This conclusion, however, relies on the expert’s position that “Xu is directed to a similar dissolvable magnesium alloy to the allow of Xiao.” Ex. 1016 ¶ 76. But Xu is not related to magnesium cast composites as claimed and instead teaches against casting. Ex. 1007 at ¶ [0059]. Moreover, Xu teaches that casting from a melt does “not have the selectively tailorable material and chemical properties as the metal composites herein.” Ex. 1007 at ¶ [0059]. So Xu itself indicates that modifying to a cast would not then be tailorable to include other teachings, such as those in Xiao. Thus, the expert’s premise for its conclusion is not accurate.

Simply asserting that the “references are analogous, the references provide well understood teachings regarding [a subject matter], and the references do not teach against their combination” are insufficient to establish obviousness and motivation to combine. *Supercell Oy v. Gree, Inc.*, IPR2020-00513, 2020 WL 3455515, at *7 (PTAB June 24, 2020). Moreover, to successfully assert obviousness, a party must avoid “*ex post* reasoning” and “hindsight.” *DirecTV, LLC v. Qurio Holdings, Inc.*, IPR2015-02006, Paper 6 at 13 (PTAB Apr. 4, 2016). Thus, one “must

not pick and choose isolated elements from the prior art and combine them so as to yield the invention in question if such combination would not have been obvious at the time of invention.” *Abbott Labs. v. Sandoz, Inc.*, 544 F.3d 1341, 1348 (Fed. Cir. 2008) (quoting *Dennison Mfg. Co. v. Panduit Corp.*, 475 U.S. 809, 810 (1986)).

Petitioner has failed to show a motivation to combine and obviousness.

The Board agrees:

Ultimately, however, we agree with Patent Owner that there is a significant question as to why one of ordinary skill in the art seeking to form a **magnesium cast composite** would have looked to particle sizes in a reference directed to sintered magnesium **powder composites**. Prelim. Resp. 54. This is especially pertinent because Xu appears to disclose that metal alloys formed by casting from a melt “do not have the selectively tailorable material and chemical properties” of the disclosed powder-based composites. Ex. 1007 ¶ 59.

Paper 14 at 24-25 (emphasis added)

Moreover, the USPTO has twice made determinations finding the claims patentable over Xiao, finding that Xiao teaches the use of aluminum to form the precipitates that drive dissolution and there is no suggestion from Xiao to substitute copper, nickel, iron or cobalt for the aluminum. Ex. 1009 at 4. The district court ruled the same when it granted summary judgment of no invalidity.

For this reason alone, Petitioner failed to prove that Xiao in view of Xu renders the claims unpatentable.

VII. CONCLUSION

Based on the foregoing reasons, the Board should conclude that original Claims 76-81 are patentable.

Dated: March 27, 2024

Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that this response was served to lead and back-up counsel for Petitioner by e-mail on March 27, 2024, as follows:

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CERTIFICATE OF COMPLIANCE

Patent Owner, Terves, LLC, certifies the following:

1. This brief complies with the type-volume limitation of 37 C.F.R. § 42.24(c)(4). Specifically, this brief contains less than 5,600 words, excluding parts of the brief exempted by 37 C.F.R. § 42.24(c), according the word count function of Microsoft Word; and

2. This brief complies with the typeface requirements of 37 C.F.R. § 42.6(a)(2)(ii) and the type style requirements of 37 C.F.R. § 42.6(a)(2)(iii). Specifically, this brief has been prepared in a proportionally spaced typeface using Microsoft Word in a 14 point Times New Roman font.

Respectfully submitted,

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