

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

QUALCOMM INCORPORATED,¹
Petitioner,

v.

UNM RAINFOREST INNOVATIONS,
Patent Owner.

IPR2021-00375
Patent 8,265,096 B2

Before JEAN R. HOMERE, KRISTEN L. DROESCH, and
CHARLES J. BOUDREAU, *Administrative Patent Judges*.

DROESCH, *Administrative Patent Judge*.

JUDGMENT

Final Written Decision on Remand
Denying Patent Owner's Motion to Amend
35 U.S.C. §§ 144, 318

¹ Qualcomm Incorporated did not participate in the appeal of the Final Written Decision to the U.S. Court of Appeals for the Federal Circuit and is no longer participating in this proceeding. See Paper 76, 1 n.1, 3 n.2. ZyXEL Communications Corporation was joined as a petitioner in this proceeding based on a petition and motion for joinder filed in IPR2021-00734, which was granted. Subsequently, this proceeding was terminated as to ZyXEL Communications Corporation. See Paper 81, 4.

I. INTRODUCTION

This decision is a final written decision on remand after an order from the Acting Director of the USPTO (Paper 81, “Acting Director’s Order”) and after a decision by the U.S. Court of Appeals for the Federal Circuit (“the Federal Circuit”) in *ZyXEL Communications Corp. v. UNM Rainforest Innovations*, 107 F.4th 1368 (Fed. Cir. 2024) (“Federal Circuit Decision”) regarding the Board’s original Final Written Decision (Paper 68, “Final Written Decision” or “Final Dec.”) in this proceeding. In particular, the court remanded to the Board to determine if proposed substitute claims 44–47, 49, and 50 are unpatentable as obvious under collateral estoppel based on the court’s holding that claims 1–4 and 6–8 are unpatentable as obvious. *ZyXEL*, 107 F.4th at 1371, 1384.

We have jurisdiction under 35 U.S.C. § 6, and we issue this Final Written Decision on Remand under 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons discussed below, after considering the record previously developed during trial, the Final Written Decision, the Federal Circuit Decision, and post-remand briefing, we conclude that proposed substitute claims 44–47, 49, and 50 are unpatentable as a matter of collateral estoppel and therefore deny Patent Owner’s motion to amend.

A. Procedural History

Qualcomm Incorporated (“Qualcomm”) filed the Petition in this proceeding, challenging claims 1–4 and 6–8 of U.S. Patent No. 8,265,096 B2 (“the ‘096 Patent”). Paper 1. The Board instituted *inter partes* review. Paper 14. Subsequently, ZyXEL Communications Corporation (“ZyXEL”) filed a petition and motion for joinder in IPR2021-

00734, and ZyXEL was joined as a petitioner in this proceeding. Paper 18. During the proceeding, UNM Rainforest Innovations (“Patent Owner”) filed a Motion to Amend including proposed substitute claims 44–47, 49, and 50. *See* Pet. 37 (“Motion to Amend”), Appx. A.

The Board entered a Final Written Decision in this proceeding on July 15, 2022, concluding that Qualcomm and ZyXEL established by a preponderance of the evidence that claims 1–4, 6, and 7 are unpatentable but had not established the unpatentability of claim 8. Final Dec. 82–84. The Board also determined that Patent Owner met the statutory requirements for a motion to amend and that Qualcomm and ZyXEL had not established by a preponderance of the evidence that proposed substitute claims 44–47, 49, and 50 are unpatentable, and therefore, the Board granted Patent Owner’s Motion to Amend. *Id.*

ZyXEL filed an appeal of the Final Written Decision to the Federal Circuit, and Patent Owner filed a cross-appeal. *See* Papers 69, 70. ZyXEL filed its Notice of Appeal without the involvement of Qualcomm. *See* Paper 69, 1 n.1; *see supra* note 1.

On July 22, 2024, the Federal Circuit entered a decision (1) affirming the Board’s determination that claims 1–4, 6, and 7 are unpatentable as obvious; (2) reversing the Board’s determination that claim 8 is not unpatentable for obviousness; and (3) remanding to the Board to determine if substitute claims 44–47, 49, and 50 are unpatentable under collateral estoppel based on the holding that claims 1–4 and 6–8 are unpatentable as obvious and to allow the Board to consider whether to exercise discretion to evaluate if the substitute claims are unpatentable as obvious over Talukdar, Li, and Nystrom. *See ZyXEL*, 107 F.4th at 1371, 1378, 1380, 1382–84.

Following issuance of the Federal Circuit’s Mandate (Paper 71) and with the Board’s authorization, ZyXEL and Patent Owner jointly filed a “Corrected Joint Motion to Terminate *Inter Partes* Review Pursuant to 35 U.S.C. § 317 and 37 C.F.R. § 42.72” (Paper 75, “Joint Motion”). In the Joint Motion, ZyXEL represented that it had resolved its disputes with Patent Owner, requested that it no longer participate in the proceeding, and indicated that it would take no position on Patent Owner’s proposed substitute claims. See Joint Motion 1, 6. Patent Owner requested that the Board grant the Joint Motion “and issue a certificate incorporating amended claims 44–47, 49 and 50 that were found patentable in the Final Written Decision.” *Id.* at 4; see *id.* at 6. Pursuant to 35 U.S.C. § 317, “[i]f no petitioner remains in the inter partes review, the Office may terminate the review or proceed to a final written decision under section 318(a).” On January 24, 2025, the Board entered an order terminating the proceeding without rendering a final written decision on remand as to proposed substitute claims 44–47, 49, and 50. See Paper 76 (“Termination Order”).

Subsequently, on February 20, 2025, Patent Owner filed a Request for Director Review requesting issuance of a Certificate incorporating the substitute claims in the ’096 Patent. See Paper 77. The Acting Director granted Director Review and issued an order vacating in part the Termination Order and remanding for further proceedings. See Acting Director’s Order. Specifically, the Acting Director ordered “the portion of the Board’s Order terminating the proceeding without rendering a final written decision is vacated. The proceeding remains terminated as to Petitioner.” *Id.* at 4. The Acting Director remanded the case to the Board

for consideration of the issues set forth in the Federal Circuit’s remand instructions. *See id.* at 3–4.

Pursuant to a request by Patent Owner, the Board issued an order authorizing Patent Owner to file briefing to address the issues on remand from the Federal Circuit. Paper 85. Patent Owner filed a post-remand brief on September 22, 2025. Paper 86 (“Post-Remand Br.”).

At this juncture, both Qualcomm and ZyXEL are no longer participants in this proceeding. Consistent with the Acting Director’s Order remanding to the Board for further proceedings and the Federal Circuit Decision, the Board is tasked with determining whether substitute claims 44–47, 49, and 50 are unpatentable as obvious under collateral estoppel based on the court’s holding that claims 1–4 and 6–8 are unpatentable as obvious. The Board is also tasked with determining whether to exercise its discretion to evaluate if substitute claims 44–47, 49, and 50 are unpatentable on a new ground based on a combination of Talukdar, Li, and Nystrom.

B. Proposed Substitute Claims

Proposed substitute claim 44 is independent and proposed substitute claims 45–47, 49, and 50 depend ultimately from claim 44. Claim 44 is illustrative and reproduced below:

44. A method of constructing a frame structure for data transmission, the method comprising:
 - generating a first section comprising data configured in a first format compatible with a first communication system using symbols;
 - generating a second section following the first section, the second section comprising data configured in a second format compatible with a second communication system using symbols, wherein the first communication system’s

symbols and the second communication system's symbols co-exist in one transmission scheme and wherein:
the second format is compatible with the second communication system configured to support higher mobility than the first communication system, wherein each symbol in the second communication system has a shorter symbol period than that in the first communication system; and
wherein the second communication system has pilot symbols that are denser than those in the first communication system;
generating at least one non-data section containing information describing an aspect of data in at least one of the first section and the second section; and
combining the first section, the second section and the at least one non-data section to form the frame structure.

Mot. Amend 15–16 (App'x A). Claim 44 is proposed to replace claim 1 and adds the underlined limitation. The underlined limitation is also recited in claim 8. Dependent claims 45–47, 49, and 50, are identical to, and are proposed to replace, dependent claims 2–4, 6, and 7. *See id.* at 16.

II. ANALYSIS

In the analysis that follows, we address the collateral estoppel issue identified by the Federal Circuit in the remand to the Board. *See ZyXEL*, 107 F.4th at 1384. We, however, decline to exercise our discretion to determine whether substitute claims 44–47, 49 and 50 are additionally unpatentable as obvious over the combination of Talukdar, Li, and Nystrom. *See ZyXEL*, 107 F.4th at 1377 (“We remand . . . to allow the Board to consider whether to exercise its discretion to evaluate if these claims are invalid based on a combination of Talukdar, Li, and Nystrom.”).

For the reasons provided below, we determine that proposed substitute claims 44–47, 49, and 50 are unpatentable as obvious under collateral estoppel based on the court’s holding that claims 1–4 and 6–8 are unpatentable as obvious.

A. Principles of Law

Collateral estoppel, also known as issue preclusion, is appropriate only if:

- (1) the issue is identical to one decided in the first action;
- (2) the issue was actually litigated in the first action;
- (3) resolution of the issue was essential to a final judgment in the first action; and (4) [the estopped party] had a full and fair opportunity to litigate the issue in the first action.

In re Freeman, 30 F.3d 1459, 1465 (Fed. Cir. 1994) (quoted with approval in *Google LLC v. Hammond Development Int’l, Inc.*, 54 F.4th 1377, 1381 (Fed. Cir. 2022)). Collateral estoppel, however, is not limited “to patent claims that are identical,” but “[r]ather, it is the identity of the issues that were litigated that determines whether collateral estoppel should apply.” *Ohio Willow Wood Co. v. Alps S., LLC*, 735 F.3d 1333, 1342 (Fed. Cir. 2013); see *Google v. Hammond*, 54 F.4th at 1381; *Maxlinear Inc., v. CF CRESPE LLC*, 880 F.3d 1373, 1377 (Fed. Cir. 2018).

B. Collateral Estoppel Analysis for Substitute Claims

As observed by the Federal Circuit, “[t]he substitute claims are entirely a combination of the limitations of claims 1–4 and 6–8, all of which we have now held unpatentable as obvious.” *ZyXEL*, 107 F.4th at 1383. More specifically, proposed substitute independent claim 44 recites identical limitations to claim 1 and adds the following limitation from independent

claim 8: “wherein the second communication system has pilot symbols that are denser than those in the first communication system.” *Compare* Mot. Amend 15–16 (App’x A), *with* Ex. 1001, 8:32–49, *and* Ex. 1001, 9:6–25. “[M]erely because the invention . . . is presented in . . . varying combinations of elements does not necessarily mean that the issues bearing on the nonobviousness of that concept . . . vary from one claim to the next.” *Bourns, Inc. v. United States*, 537 F.2d 486, 492 (Ct. Cl. 1976).

In the Final Written Decision, the Board determined that claim 1 was unpatentable as obvious under 35 U.S.C. § 103 over Talukdar² and Li³ (Final Written Dec. 33–52, 83), which was *affirmed* on appeal to the Federal Circuit (*ZyXEL*, 107 F.4th at 1371, 1377–78, 1384). The court held that substantial evidence supported the Board’s determination that the subject matter of claim 1 would have been obvious. *See id.* at 1378. In so holding, the court specifically addressed the limitation “wherein each symbol in the second communication system has a shorter symbol period than that in the first communication system,” recited in claim 1 (“first key element”). The limitation “wherein the second communication system has pilot symbols that are denser than those in the first communication system,” recited in independent claim 8 (“second key element”), was the focus of the patentability dispute before the court, and was addressed in detail in the court’s determination that the subject matter of claim 8 would have been obvious. *See id.* at 1378–80. In summary, the issues litigated before the Federal Circuit were (1) whether it would have been obvious to a person of

² Ex. 1012, US 2009/0067377 A1, published Mar. 12, 2009.

³ Ex. 1016, US 2007/0155387 A1, published July 5, 2007.

ordinary skill in the art to include the first key element—obviousness of the subject matter of claim 1 (*see id.* at 1377–78); and (2) whether it would have been obvious to a person of ordinary skill in the art to include the second key element—obviousness of the subject matter of claim 8 (*see id.* at 1378–80).

The resolution of the question of obviousness of the subject matter of proposed substitute claim 44 presents the same issues as those litigated before the Federal Circuit: whether it would have been obvious to a person of ordinary skill in the art to include the first key element and whether it would have been obvious to a person of ordinary skill in the art to include the second key element.

Turning to the remaining collateral estoppel requirements, we find that the issues of whether it would have been obvious to a person of ordinary skill in the art to include the first key element and whether it would have been obvious to a person of ordinary skill in the art to include the second key element were decided by, litigated before, and essential to the final judgment of the Federal Circuit. *See ZyXEL*, 107 F.4th at 1377–80. Lastly, there is no basis for finding that Patent Owner lacked a full and fair opportunity to litigate these issues before the Federal Circuit.

Patent Owner asserts that collateral estoppel does not apply to the proposed substitute claims because the proposed substitute claims do not present an identical legal issue. *See* Post-Remand Br. 1–2 (citing *Parklane Hosiery Co. v. Shore*, 439 U.S. 322 (1979); *Kroy IP Holdings, LLC v. Groupon, Inc.*, 127 F. 4th 1376 (Fed. Cir. 2025); *VirnetX Inc. v. Apple, Inc.*, 909 F. 3d 1375 (Fed. Cir. 2018); *Stephen Slesinger, Inc. v. Disney Enters., Inc.*, 702 F.3d 640, 644 (Fed. Cir. 2012); *B & B Hardware, Inc. v. Hargis Indus., Inc.*, 575 U.S. 138 (2015); *Bourns*); *id.* at 4–5 (citing *Bourns*; *XY*,

LLC v. Trans Ova Genetics, L.C., 890 F.3d 1282, 1294 (Fed. Cir. 2018)). Patent Owner contends that proposed substitute claim 44 presents a unique issue because it includes both the first key element and the second key element. *See id.* at 2–4. Patent Owner asserts that neither the Federal Circuit nor the Board has considered the specific issue for proposed substitute claim 44—whether a person of ordinary skill in the art would have been motivated to include both the first and second key elements. *See id.* at 3–5, 8.

We see no difference between Patent Owner’s framing of the issue as whether a person of ordinary skill in the art would have been motivated to include both the first and second key elements and our finding that proposed substitute claim 44 presents the issues of whether it would have been obvious to a person of ordinary skill in the art to include the first key element and whether it would have been obvious to a person of ordinary skill in the art to include the second key element. As explained above, whether it would have been obvious to a person of ordinary skill in the art to include the first key element and whether it would have been obvious to a person of ordinary skill in the art to include the second key element were decided by, litigated before, and essential to the Federal Circuit’s final judgment, and Patent Owner had a full and fair opportunity to litigate these issues before the court. *See ZyXEL*, 107 F.4th at 1377–80.

We also find misplaced Patent Owner’s argument that “[u]sing one method or the other was found obvious,” in reference to the first key element recited in claim 1 and the second key element recited in claim 8. Post-Remand Br. 3; *see id.* at 2. Instead, the Federal Circuit affirmed the determination that the method of claim 1, which includes the first key

element, would have been obvious, **and** determined the method of claim 8, which includes the second key element, would have been obvious. See *ZyXEL*, 107 F.4th at 1377–80. In other words, contrary to Patent Owner’s argument, using one method was found obvious and using the other method also was found obvious.

After considering the record previously developed during trial, the Final Written Decision, and the Federal Circuit Decision, as well as the post-remand briefing, we determine that the application of collateral estoppel to proposed substitute claim 44 is appropriate. It is also appropriate to apply collateral estoppel to substitute claims 45–47, 49, and 50. This is because proposed substitute claims 45–47, 49, and 50 depend from proposed substitute claim 44 and recite identical limitations to dependent claims 2–4, 6, and 7. Therefore, the resolution of the question of obviousness of the subject matter of proposed substitute claims 45–47, 49, and 50 necessarily presents the same issues of whether it would have been obvious to a person of ordinary skill in the art to include the first key element and whether it would have been obvious to a person of ordinary skill in the art to include the second key element.

Accordingly, we determine that proposed substitute claims 44–47, 49 and 50 are unpatentable as obvious under collateral estoppel based on the holding by the Federal Circuit that claims 1–4 and 6–8 are unpatentable as obvious.

III. CONCLUSION

Claims 44–47, 49 and 50 are unpatentable as obvious under collateral estoppel based on the holding by the Federal Circuit that claims 1–4 and 6–8

are unpatentable as obvious. Accordingly, Patent Owner's Motion to Amend is denied.

IV. ORDER

Accordingly, it is

ORDERED that proposed substitute claims 44–47, 49, and 50 are unpatentable and therefore Patent Owner's Motion to Amend is denied; and

FURTHER ORDERED that, because this Decision on Remand amounts to 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.

Final Outcome After Remand from the U.S. Court of Appeals for the Federal Circuit and Acting Director Remand:

Motion to Amend Outcome on Remand	Claims
Original Claims Cancelled by Amendment	
Substitute Claims Proposed in Amendment	44–47, 49, 50
Substitute Claims: Motion to Amend Granted	
Substitute Claims: Motion to Amend Denied	44–47, 49, 50
Substitute Claims: Not reached	

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