

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

GUANGZHO EKO TRADING DEVELOPMENT CO., LTD.,

Petitioner,

v.

NINE STARS GROUP (U.S.A.) INC.,

Patent Owner.

Case No. IPR2025-01369

U.S. Patent No. 10,928,796

PATENT OWNER'S SUR-REPLY

TABLE OF CONTENTS

I. INTRODUCTION	1
II. PETITIONER RETAINS THE BURDEN; PATENT OWNER WAS NOT REQUIRED TO PRESENT A COUNTEREXPERT OR TAKE A DEPOSITION	2
III. PATENT OWNER MADE NO ADMISSION THAT ZHENG PERFORMS THE CLAIMED METHOD	4
IV. PETITIONER’S CONSTRUCTION IMPROPERLY COLLAPSES THREE CLAIMED STATES INTO TWO	5
A. Patent Owner Does Not Import a Particular Hardware State Machine	5
B. “Working State” Is Not Defined as Every Non-Sleep Condition	6
C. The Prosecution History Refutes Petitioner’s Two-Condition Reading	7
V. PETITIONER CANNOT TREAT ZHENG AS BOTH A COMPLETE DISCLOSURE AND AN INCOMPLETE REFERENCE REQUIRING UNSTATED MODIFICATIONS	8
A. A Missing Limitation Requires a Reasoned Obviousness Bridge	8
B. The Petition Admitted the Watchdog-Timer Gap	9
C. Known Watchdog Timers Do Not Establish the Claimed Modification	9
D. The Reply Cannot Convert an Obvious-to-Add Theory Into Direct Disclosure	10
E. Wang Does Not Cure the Underlying Method Deficiencies	10
VI. ZHENG DOES NOT DISCLOSE OR RENDER OBVIOUS THE ORDERED METHOD OF CLAIM 1	11
A. Zheng’s Sensing Steps Do Not Establish the Claimed State Relationships	11
B. Zheng Does Not Disclose the Claimed Sleep State or Microcontroller-Controlled Cutoff of Power to the Active Infrared Sensor	11
C. Zheng Does Not Disclose a Microcontroller Working State Reached After Wake-Up	14

D. The Watchdog Timer Remains Missing	14
E. Zheng Does Not Disclose the Remaining Positive-Detection Sequence as Claimed	15
VII. CLAIM 2 REQUIRES A RESTORE-STABILIZE-EMIT SEQUENCE, NOT MERELY PRE-POWERING A RECEIVER	16
VIII. PETITIONER HAS NOT PROVED CLAIMS 3-6 UNPATENTABLE	17
IX. CLAIMS 7-12 ARE NOT RENDERED OBVIOUS BY A USER WHO “WALKS UP” OR BY WANG	19
X. PATENT OWNER’S POSITA DEFINITION DOES NOT MAKE THE CLAIMS OBVIOUS	20
XI. THE GOMEZ DECLARATION CANNOT SUPPLY THE MISSING DISCLOSURES AND SHOULD RECEIVE LITTLE OR NO WEIGHT ON THE DISPUTED ISSUES	21
A. Formal Technical Qualification Does Not Establish Reliability or Weight	21
B. Petitioner Characterized the Declaration as Confirmatory, Not Independent Analysis	22
C. Section 42.65(a) and Federal Circuit Authority Require Underlying Facts and Reasoning	22
D. An Expert Cannot Create Disclosure by Applying Claim Labels After the Fact	24
E. The Board Should Disregard Legal Conclusions and Unsupported Gap-Filling Opinions	25
XII. CONCLUSION	26
CERTIFICATE OF COMPLIANCE	27
CERTIFICATE OF SERVICE	28

TABLE OF AUTHORITIES

Cases

Arendi S.A.R.L. v. Apple Inc., 832 F.3d 1355 (Fed. Cir. 2016)	8-9
Dynamic Drinkware, LLC v. National Graphics, Inc., 800 F.3d 1375 (Fed. Cir. 2015)	2
FanDuel, Inc. v. Interactive Games LLC, 966 F.3d 1334 (Fed. Cir. 2020)	2
Henny Penny Corp. v. Frymaster LLC, 938 F.3d 1324 (Fed. Cir. 2019)	10
In re Express Mobile, Inc., 2024 WL 2818365 (Fed. Cir. May 29, 2024)	1, 3-4, 23
In re Magnum Oil Tools International, Ltd., 829 F.3d 1364 (Fed. Cir. 2016)	2
Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd., 821 F.3d 1359 (Fed. Cir. 2016)	10
Persion Pharmaceuticals LLC v. Alvogen Malta Operations Ltd., 945 F.3d 1184 (Fed. Cir. 2019)	13
Pfizer Inc. v. Sanofi Pasteur Inc., 94 F.4th 1341 (Fed. Cir. 2024)	18
Realtime Data, LLC v. Iancu, 912 F.3d 1368 (Fed. Cir. 2019)	9
Sundance, Inc. v. DeMonte Fabricating Ltd., 550 F.3d 1356 (Fed. Cir. 2008)	21
TQ Delta, LLC v. Cisco Systems, Inc., 942 F.3d 1352 (Fed. Cir. 2019)	1, 3-4, 23-25
Xerox Corp. v. Bytemark, Inc., IPR2022-00624, Paper 9 (PTAB Aug. 24, 2022) (precedential)	23

Statutes

35 U.S.C. § 103	8, 21
35 U.S.C. § 316(e)	2

Regulations

37 C.F.R. § 42.24(a)(1)	27
37 C.F.R. § 42.24(c)(4)	27
37 C.F.R. § 42.24(d)	27
37 C.F.R. § 42.51(b)(1)(ii)	3
37 C.F.R. § 42.65(a)	1, 4, 23-24

I. INTRODUCTION

Petitioner's Reply changes labels, shifts burdens, and treats Mr. Gomez's conclusions as substitutes for disclosure. Patent Owner did not admit that Zheng performs the claimed method. A receiver power-on interval, infrared sensing, and a dormancy mode do not establish the claimed relationship among standby, sleep with sensor-power cutoff, watchdog-timer wake-up to working, and renewed sensing.

The Reply's construction that "working state" means every non-sleep condition reduces three recited states to two meaningful conditions and conflicts with the prosecution history. Its colored annotation of Figure 2 is advocacy, not intrinsic disclosure.

Most importantly, Zheng does not disclose a watchdog timer. The Petition admitted that "Zheng does not specifically state that it employs a 'timer.'" Pet. 37. The Reply now says "Zheng's timer performs the very same function." Reply 17. No Zheng paragraph identifies such a timer or the claimed wake transition.

Mr. Gomez's declaration does not cure these deficiencies. The issue is weight, not categorical exclusion. Petitioner called the subject matter understandable "without extensive expert testimony" and said the declaration "simply serves" to confirm the Petition and summarize background. Pet. 5. Unsupported gap-filling is entitled to little or no weight under 37 C.F.R. § 42.65(a). *In re Express Mobile, Inc.*,

2024 WL 2818365, at *4 (Fed. Cir. May 29, 2024); *TQ Delta, LLC v. Cisco Systems, Inc.*, 942 F.3d 1352, 1358–59 (Fed. Cir. 2019).

For the reasons below and in the Patent Owner Response, Petitioner has not proved any challenged claim unpatentable by a preponderance of the evidence.

II. PETITIONER RETAINS THE BURDEN; PATENT OWNER WAS NOT REQUIRED TO PRESENT A COUNTEREXPERT OR TAKE A DEPOSITION

The Reply repeatedly argues that Patent Owner did not submit an expert declaration, did not depose Mr. Gomez, and did not identify an alternative sensor location. Reply 2, 9-10, 20, 22. That criticism improperly shifts the burden. Under 35 U.S.C. §316(e), Petitioner bears the ultimate burden of proving every proposition of unpatentability by a preponderance of the evidence, and that burden never shifts to Patent Owner. *Dynamic Drinkware, LLC v. National Graphics, Inc.*, 800 F.3d 1375, 1378-79 (Fed. Cir. 2015); *In re Magnum Oil Tools International, Ltd.*, 829 F.3d 1364, 1375-78 (Fed. Cir. 2016). It is therefore “inappropriate to shift the burden to the patentee after institution to prove that the patent is patentable.” *FanDuel, Inc. v. Interactive Games LLC*, 966 F.3d 1334, 1341-42 (Fed. Cir. 2020).

Patent Owner’s position is to identify why Petitioner’s proof does not establish the instituted grounds. Patent Owner needs not affirmatively prove that no engineer could ever modify Zheng, identify every alternative implementation of

Zheng, or obtain a second expert to say that Zheng does not contain words, circuitry, or relationships absent from its disclosure. Petitioner must establish where each limitation is found or why the particular missing subject matter would have been supplied by a POSITA in the manner claimed. Patent Owner's choice not to incur the expense of a counter-declaration does not relieve Petitioner of that burden.

Patent Owner may rely on the documentary record to show that Zheng does not contain the claimed component, actor, causal relationship, state transition, timing mechanism, or ordered sequence. Nor does Patent Owner's decision not to depose Gomez constitute an admission, waiver, or concession. Cross-examination is authorized routine discovery, not a prerequisite to contesting a declaration. See 37 C.F.R. §42.51(b)(1)(ii).

Patent Owner's record-based arguments are not improper attorney testimony. No counterexpert is required to observe that the Petition admits Zheng does not specifically disclose a wake timer, that 1.502ms lies outside the claimed 2-50ms range, or that "do not work" does not expressly mean electrical power cutoff. Even un rebutted expert testimony need not be accepted when conclusory. *In re Express Mobile, Inc.*, 2024 WL 2818365, at *4 (Fed. Cir. May 29, 2024); *TQ Delta, LLC v. Cisco Systems, Inc.*, 942 F.3d 1352, 1358–59 (Fed. Cir. 2019). The absence of a Patent Owner expert or deposition does not establish unpatentability.

The Board is not required to accept even ostensibly un rebutted expert testimony. *In re Express Mobile, Inc.*, No. 2023-1076, slip op. at 10-11 (Fed. Cir. May 29, 2024). Conclusory testimony is not substantial evidence merely because no competing witness was retained. *TQ Delta, LLC v. Cisco Systems, Inc.*, 942 F.3d 1352, 1358-59 (Fed. Cir. 2019). And under 37 C.F.R. §42.65(a), expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.

Thus, the proper question is not whether Gomez’s declaration was cross-examined. The proper question is whether each disputed opinion is supported by identified source material and reasoned technical analysis. Patentability is determined by the Board from the claims, intrinsic record, asserted references, and any properly supported factual evidence-not by counting retained experts.

III. PATENT OWNER MADE NO ADMISSION THAT ZHENG PERFORMS THE CLAIMED METHOD

The Reply builds its opening around a false equivalence. It identifies three broad facts - pre-powering, sensing, and low-power operation—and declares that Patent Owner therefore admitted Zheng’s “working,” “standby,” and “sleep” states. Reply 1, 7-9. Patent Owner admitted no such thing.

Claim 1 requires more than three intervals: standby pulse control; a no-reflection transition to sleep; microcontroller cutoff of sensor power in sleep;

watchdog-timer wake-up from sleep to working; repetition under standby; and a separate positive-detection branch with lid control and post-closing sleep. Ex. 1001, claim 1.

Generic sensing and power saving do not concede the claimed component, actor, causation, state transitions, watchdog mechanism, or sequence. The assertion that this “should end the analysis” assumes the conclusion. Reply 8.

Petitioner’s citation to cases stating that anticipation is not an *ipsissimis verbis* test is beside the point. Reply 9. Patent Owner does not demand identical terminology. And the instituted grounds are obviousness grounds, not anticipation grounds. Regardless of nomenclature, Petitioner must show that the prior art actually discloses the claimed functions and relationships or provide a supported obviousness rationale for supplying what is missing. Assigning the patent’s labels to unrelated intervals does not satisfy that requirement.

IV. PETITIONER’S CONSTRUCTION IMPROPERLY COLLAPSES THREE CLAIMED STATES INTO TWO

A. Patent Owner Does Not Import a Particular Hardware State Machine

The Reply suggests that Patent Owner seeks to limit the method claims to a physical state-machine circuit shown in an embodiment. Reply 6-7. That is not Patent Owner’s position. “State-machine architecture” is shorthand for the expressly

claimed states, functions, conditions, and transitions. Those limitations appear in claim 1 itself.

Petitioner's embodiment-importation cases do not answer whether Zheng teaches the express method states, transitions, and power-control acts.

B. “Working State” Is Not Defined as Every Non-Sleep Condition

The Reply argues that working state is simply “the inverse” of sleep and necessarily spans the entire time from wake-up until the next sleep event. Reply 3–6. The claim does not say that. It says the microcontroller wakes “from the sleep state to the working state”; it separately recites operation “in a standby state”; and it states that, upon a detected reflection, the microcontroller remains in a working state. Ex. 1001, claim 1. A transition from one named state to another does not establish that the latter includes every other recited state or every awake operation.

Nor does the word “remaining” erase standby as a separately recited condition. “Remaining” describes the positive-detection branch: instead of entering sleep after no reflection is received, the microcontroller remains available to execute the lid-control sequence. It does not define working state as all non-sleep time, and it does not render standby superfluous. At a minimum, the three terms must retain their separate claim-relevant functions and transitions.

The Reply's annotated Figure 2 is not intrinsic evidence. Reply 5. The original has no colored state boundaries; those regions were selected for this proceeding and cannot replace the claim or prosecution history.

C. The Prosecution History Refutes Petitioner's Two-Condition Reading

The Reply mischaracterizes the prosecution history when it says Applicant defined working state as the conventional "normal mode" occupied whenever the system was not sleeping. Reply 6. Applicant was describing the deficiency of the prior art. Applicant explained that Yang was "ONLY configured to set the microprocessor between a normal mode (working mode) and a sleep mode," and that such conventional two-mode operation did not provide the claimed third state. Ex. 1002, 170-72. Applicant further explained that Yang failed to "initially power the active infrared sensor while no infrared pulse signal is generated yet." *Id.* at 172. The Examiner then allowed the claims because the prior art did not teach or suggest a microcontroller "having three different power states (standby state, sleep state, and working state)." *Id.* at 186.

Petitioner now uses Applicant's description of Yang's deficient two-mode system as though it were Applicant's construction of the claimed working state. That reverses the prosecution record. Petitioner's "asleep versus everything else" construction recreates the very two-condition paradigm Applicant distinguished and the Examiner found insufficient. Even if certain operations may occur while the

microcontroller remains broadly operational, Petitioner still must identify the claimed transition from sleep to working and the separately recited standby sensing condition. Zheng does not disclose those relationships.

V. PETITIONER CANNOT TREAT ZHENG AS BOTH A COMPLETE DISCLOSURE AND AN INCOMPLETE REFERENCE REQUIRING UNSTATED MODIFICATIONS

The Reply advances incompatible characterizations of Ground 1. It says Zheng “already operates in the way the claims require,” teaches all claimed states, and needs no modification or motivation. Reply 15. Yet the Petition expressly acknowledged that “Zheng does not specifically state that it employs a ‘timer’” to wake its microcontroller from dormancy and then relied on Gomez and Exhibits 1006-1008 to argue that a POSITA would have selected a watchdog timer. Pet. 37-42. Petitioner cannot erase an admitted difference by later treating Zheng as complete.

A. A Missing Limitation Requires a Reasoned Obviousness Bridge

Patent Owner does not contend that every §103 ground requires a second printed publication or that a primary reference must anticipate. But when a limitation is absent, Petitioner must identify the proposed modification and explain, with evidence, why a POSITA would have made it with a reasonable expectation of obtaining the claimed arrangement. *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355,

1361-63 (Fed. Cir. 2016). *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1372-73 (Fed. Cir. 2019), applies where the primary reference discloses every limitation and other evidence merely explains that disclosure; it does not excuse proof of a missing element.

B. The Petition Admitted the Watchdog-Timer Gap

The Petition’s admission is substantive. Zheng does not identify even the timer allegedly responsible for waking the microcontroller, much less a watchdog timer arranged to wake it “from the sleep state to the working state” and cause repetition under standby. A preset duration is not itself a timer; a timer is not necessarily a watchdog timer; and recurring sensing does not establish a watchdog-controlled wake transition. Thus, Petitioner’s watchdog theory necessarily depends on adding or selecting subject matter outside Zheng.

C. Known Watchdog Timers Do Not Establish the Claimed Modification

Gropper, Wegelin, and Parsons may show that watchdog timers existed. They do not explain why a POSITA would select one for Zheng rather than another wake mechanism, or how it would produce the claimed sleep-to-working transition and renewed standby sequence. Component availability is not a Zheng-specific reason to make the claimed modification.

D. The Reply Cannot Convert an Obvious-to-Add Theory Into Direct Disclosure

The Reply now asserts that “Zheng’s timer performs the very same function in the same way.” Reply 17. That direct-disclosure theory differs from the Petition’s position that Zheng identifies no such timer and a POSITA would have supplied one. The Board should hold Petitioner to the Petition. *Intelligent Bio-Systems, Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369–70 (Fed. Cir. 2016); *Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324, 1329–31 (Fed. Cir. 2019). In any event, no cited Zheng paragraph identifies a timer, watchdog configuration, or timer-caused wake from dormancy.

E. Wang Does Not Cure the Underlying Method Deficiencies

Ground 2 expressly relies on Wang, but only for alleged front/top sensor placement in claims 7-12. Wang does not supply the watchdog timer, the claimed sleep-to-working transition, microcontroller-controlled cutoff of power to the asserted active infrared sensor, the restore-stabilize-emit sequence, or the timing limitations inherited from claims 3-6. A supplemental placement teaching cannot cure the deficiencies in the base method claims.

VI. ZHENG DOES NOT DISCLOSE OR RENDER OBVIOUS THE ORDERED METHOD OF CLAIM 1

A. Zheng's Sensing Steps Do Not Establish the Claimed State Relationships

Patent Owner does not dispute that Zheng transmits and receives infrared signals. But that establishes, at most, a sensing operation. It does not prove that Zheng's microcontroller enters the claimed standby state from the claimed working state after a watchdog wake event, or that the no-reflection branch sets the microcontroller into a sleep state in which the microcontroller cuts power of the active infrared sensor.

Zheng's steps S101-S104 primarily address detection reliability: a first pulse is transmitted, a reflected signal may be detected, additional pulses may be transmitted, and repeated detections may trigger lid opening. Ex. 1004 ¶¶ 51–63. Petitioner's designation of all emission and detection intervals as a claimed "standby state" does not supply the missing controller transitions, power-control relationship, or watchdog wake mechanism.

B. Zheng Does Not Disclose the Claimed Sleep State or Microcontroller-Controlled Cutoff of Power to the Active Infrared Sensor

The Reply relies on two different disclosures that it improperly merges. First, Zheng states that the infrared receiving tube may be powered on in advance of step

S101 and maintained powered for a limited interval. Ex. 1004 ¶¶ 65–66. Second, Zheng states that the microcontroller may automatically enter a dormancy mode “when the infrared transmitting tube and the infrared receiving tube do not work.” Id. ¶ 113. Neither disclosure says that, when no reflection is received, the microcontroller enters sleep and cuts off power of the active infrared sensor.

The direction of causation in paragraph 113 is particularly important. Zheng says the microcontroller enters dormancy when the transmitting and receiving tubes “do not work.” It does not say that entering dormancy causes the microcontroller to cut electrical power to those components. A component may not work because it is inactive, disabled, not transmitting, not sampling, or otherwise idle while still connected to a supply. “Do not work” is not an express disclosure of electrical power cutoff.

The Reply also reasons that because the receiving tube is powered on for a limited time, “it follows” that “the sensor” is powered off. Reply 11-12. Even if that inference establishes that the receiving tube is not powered at some later time, it does not establish the claimed limitation. Petitioner must still show that the microcontroller performs the cutoff, that the object of the cutoff is the claimed active infrared sensor, that the cutoff occurs in the microcontroller’s sleep state, and that this state is selected if no reflection output signal is received. Zheng does not connect

its optional receiver-powering disclosure to its dormancy statement or to the no-reflection branch in the manner claimed.

Petitioner's mapping is also internally inconsistent. To satisfy "active infrared sensor," Petitioner aggregates Zheng's transmitting tube and receiving tube into one claimed sensor. Pet. 21-23; Ex. 1005 ¶¶ 139–57. But to satisfy cutoff of power "of the active infrared sensor," the Reply says that cutting power only to the receiving tube is enough because "[t]he claim is satisfied by any power cut-off." Reply 13. Petitioner cannot define the claimed sensor collectively when aggregation helps, then disaggregate it when only one component has an express power-control disclosure. Claim 2 removes any doubt by reciting "cutting off the power supply of the active infrared sensor" and later "restoring the power supply of the active infrared sensor." Ex. 1001, claim 2. The intrinsic record consistently concerns power control of the claimed sensing unit, not an arbitrary partial reduction somewhere within a reconstructed collection of components.

If Petitioner intends its "it follows" reasoning as inherency, it has not met the high standard. Inherency may not be established by probabilities or possibilities; the claimed condition must necessarily result. *Persion Pharmaceuticals LLC v. Alvogen Malta Operations Ltd.*, 945 F.3d 1184, 1191 (Fed. Cir. 2019). The record does not establish that Zheng necessarily uses the claimed microcontroller-controlled cutoff and state transition merely because it periodically powers a receiving tube.

C. Zheng Does Not Disclose a Microcontroller Working State Reached After Wake-Up

The Reply identifies Zheng's 1.502ms receiver power-on interval as the claimed working state and adds that it occurs "after emerging from dormancy." Reply 14-15. The cited Zheng paragraphs do not say that. They state that, before step S101, the receiving tube may be powered on in advance for a third preset time. Ex. 1004 ¶¶ 65–66. They do not state that the microcontroller has just awakened from dormancy, that the interval is itself a state of the microcontroller, or that this optional receiver-power interval follows the no-reflection sleep branch.

A peripheral receiver's supply interval is not necessarily a microcontroller state. Zheng discloses no firmware sequence or circuit relationship connecting the interval to a wake from dormancy as claim 1 requires.

D. The Watchdog Timer Remains Missing

The Petition expressly acknowledged that Zheng "does not specifically state that it employs a 'timer' for purposes of waking its microcontroller from dormancy." Pet. 37. The Reply nevertheless asserts that "Zheng's timer performs the very same function in the same way" as the patent's watchdog timer. Reply 17. The Reply identifies no "Zheng timer." Zheng's preset times govern when signals are transmitted and how long the receiver may be powered. A disclosed time interval is

not itself a disclosed timer, and it does not identify the mechanism that wakes a sleeping microcontroller.

Petitioner cannot have it both ways. If Zheng discloses every limitation, Petitioner must identify the watchdog timer in Zheng. It cannot. If Petitioner proposes adding one based on background references, it must explain why a POSITA would select and integrate that mechanism to achieve the claimed sequence. Showing that watchdog timers existed does not establish the claimed use.

The Reply's assertion that the patent does not specially praise a watchdog timer is irrelevant. The timer is an express claim limitation, and the specification identifies its function: waking the microcontroller after sleep so the working and sensing cycle can resume. Ex. 1001, 2:18-22, 2:35-51, claim 1.

The secondary references identify watchdog timers where used; Zheng does not. Pet. 39-41. Knownness alone does not supply a reasoned bridge to the claimed transition.

E. Zheng Does Not Disclose the Remaining Positive-Detection Sequence as Claimed

Claim 1 also requires delaying for a few seconds after the motor opens the lid and setting the microcontroller into the sleep state after the lid closes. Zheng states that its motor can open and close the cover, but the Petition inferred a multi-second hold merely because a user needs time to deposit trash. Pet. 32–33; Ex. 1005 ¶¶ 203-

10. An assumed convenience feature is not an identified disclosure. Nor does restarting a detection process necessarily establish that, after closing, the microcontroller enters the same claimed sleep state in which it cuts power to the active infrared sensor. Pet. 33-34; Ex. 1005 ¶¶ 212–17. The Reply does not cure either deficiency.

VII. CLAIM 2 REQUIRES A RESTORE-STABILIZE-EMIT SEQUENCE, NOT MERELY PRE-POWERING A RECEIVER

Claim 2 further requires restoring power to the active infrared sensor, delaying for a preset threshold time for the active infrared sensor to enter a stable working state, and then controlling the active infrared sensor to emit the pulse signal. Ex. 1001, claim 2. The Reply says Zheng’s 1.502 ms pre-power interval necessarily supplies this sequence. Reply 18-19. It does not.

Zheng expressly refers to powering the receiving tube, not restoring the power supply of the active infrared sensor reconstructed by Petitioner from both transmitting and receiving tubes. Ex. 1004 ¶¶ 65-66. Zheng does not state that the preceding condition was the claimed sleep state, that a watchdog timer awakened the microcontroller, that the active infrared sensor’s power is restored, or that the purpose and result of the interval are entry into a stable working state. Petitioner’s statement that a skilled artisan could infer that the interval “might help” stabilization

underscores the deficiency: a possible benefit is not the claimed disclosure and does not establish inherency.

Petitioner also conflates two different “working state” usages. Claim 1 recites a working state of the microcontroller. Claim 2 recites a “stable working state” entered by the active infrared sensor after restoration of power. Zheng’s optional receiver pre-power period does not, by itself, establish either the claimed microcontroller transition or the claimed stable state of the active infrared sensor as a whole.

The fourth preset time does not fill the gap. It is the period during which Zheng maintains the receiver powered, including sensing operation, not the threshold delay before pulse emission. Petitioner cannot assemble the claim by selecting portions of separate timing disclosures and assigning them new functions that Zheng never identifies.

VIII. PETITIONER HAS NOT PROVED CLAIMS 3-6 UNPATENTABLE

Claims 3 and 4 require that the “preset time” associated with the watchdog-timer wake cycle be between 100ms and 500ms. Petitioner cites Zheng’s 200 ms first preset time, but Zheng describes that value as the interval associated with transmission of a first pulse waveform. Ex. 1004 ¶¶ 51-52. It does not identify 200ms as a microcontroller sleep period ending in wake-up by a watchdog timer. Petitioner’s demonstrative calculation that subtracts assumed power-on and sensing

intervals to create a dormancy duration is not a Zheng disclosure. Pet. 35–40; Ex. 1005 ¶¶ 219-39. Thus, numerical overlap in an unrelated interval does not satisfy claims 3 and 4.

Claims 5 and 6 require a preset threshold time between 2 ms and 50 ms. Petitioner acknowledges that the pre-power interval it selected from Zheng is 1.502ms - outside the claimed range. Pet. 44-46. Petitioner then proposes increasing the interval to approximately 2 ms as routine optimization. That theory assumes the very proposition not established: that Zheng recognizes the pre-power interval as a stabilization variable having the claimed relationship to a stable working state of the active infrared sensor.

Routine optimization is not a license to move any nearby number into a claimed range. The analysis asks whether the prior art recognized the variable’s effect and whether a skilled artisan would have been motivated, with a reasonable expectation of success, to bridge the gap. *Pfizer Inc. v. Sanofi Pasteur Inc.*, 94 F.4th 1341, 1347-49 (Fed. Cir. 2024). Zheng does not identify sensor stabilization as the result controlled by the third preset time, does not instruct increasing that time, and does not disclose the claimed full-sensor restore–stabilize–emit sequence. Mr. Gomez’s assertion that a slightly longer delay would “better ensure” preparation of the sensor, Ex. 1005 ¶¶ 286-91, is an unsupported optimization conclusion, not a teaching from Zheng.

IX. CLAIMS 7-12 ARE NOT RENDERED OBVIOUS BY A USER WHO “WALKS UP” OR BY WANG

The Reply argues that because Zheng detects a person who “walks up” to a trash can, the most obvious sensor location is necessarily the front can edge. Reply 19-20. That is not a disclosure of the claimed geometry. Claims 7-12 require an induction area arranged above an induction window, with the induction window located on the front can edge. Ex. 1001, claims 7-12. “Walks up” describes user behavior, not the location of a window or the spatial relationship between a window and an induction area.

Petitioner criticizes Patent Owner for not proving where else Zheng’s sensor could be located. Reply 20. Patent Owner has no such burden. Petitioner must show why the specific claimed location and relationship would have been selected. General proximity detection can be implemented from different portions or orientations of a product. The absence of an alternative-location exhibit from Patent Owner does not transform Zheng’s silence into disclosure.

Wang does not cure the problem. Patent Owner does not concede that Wang discloses every part of the claimed spatial relationship; Wang describes a sensor on a front side of an upper structure and extending through a mounting hole, whereas the claims recite an induction window on the “front can edge” and an induction area above it. Pet. 49–52; Ex. 1010 ¶¶ 18-23. But even assuming arguendo that Wang

supplies the added location limitation, claims 7-12 depend from claims 1-6. Wang does not disclose or suggest the missing watchdog-timer wake transition, the claimed microcontroller-controlled sensor-power cutoff, or the restore-stabilize-emit sequence. A placement reference cannot cure the deficiencies in the underlying method.

X. PATENT OWNER’S POSITA DEFINITION DOES NOT MAKE THE CLAIMS OBVIOUS

The Reply calls Patent Owner’s POSITA definition “far too high” because it refers to experience with low-power, battery-operated sensor-and-motor consumer devices. Reply 21. But Patent Owner proposed the same general educational and experience level as Petitioner - a relevant engineering degree and approximately two years of pertinent experience - with the experience tied to the technology actually claimed. POR 11-13; Pet. 13. That is field specificity, not extraordinary skill.

The patent itself concerns a battery-powered infrared sensor, a microcontroller with sleep and watchdog functions, power control, a motor-driving circuit, and the tradeoff between standby current and reliable operation. Ex. 1001, 1:20-2:58. Familiarity with those subjects is what permits the hypothetical artisan to understand the patent and references. It does not transform the artisan into a genius.

More fundamentally, skill level is a lens through which evidence is read; it is not missing evidence. A skilled artisan does not approach Zheng already knowing

the claims and then rename every interval to reproduce them. The Reply's statement that a "more knowledgeable" POSITA would "plainly recognize" all three claimed states is simply a conclusion. Reply 21. No level of ordinary skill converts an unspecified timing mechanism into a watchdog timer, "do not work" into microcontroller-controlled power cutoff, or a receiver power interval into the claimed state sequence without the reasoned proof § 103 requires.

XI. THE GOMEZ DECLARATION CANNOT SUPPLY THE MISSING DISCLOSURES AND SHOULD RECEIVE LITTLE OR NO WEIGHT ON THE DISPUTED ISSUES

A. Formal Technical Qualification Does Not Establish Reliability or Weight

Patent Owner does not contend that an electrical engineer is categorically barred from testifying. Reply 22. Sundance permits technical testimony; it does not require acceptance of unsupported opinions or legal conclusions. 550 F.3d 1356, 1363-64 (Fed. Cir. 2008).

Claim construction and ultimate obviousness are legal questions. Gomez may inform technical facts, but cannot determine claim scope, override prosecution history, or make controlling legal conclusions.

B. Petitioner Characterized the Declaration as Confirmatory, Not Independent Analysis

Petitioner itself stated that the claims and references involve “straightforward, easily understandable subject matter” that can be understood “without extensive expert testimony.” Pet. 5. It then stated that Mr. Gomez’s declaration “simply serves” to confirm the Petition’s interpretation and summarize background knowledge. *Id.* That description is significant. It confirms that the declaration is derivative of the Petition’s theory rather than independent proof of disclosures absent from Zheng.

Patent Owner does not speculate who drafted the declaration. The record shows that, on disputed points, it tracks the Petition’s labels, demonstratives, and conclusions without independently disclosed testing or data. Petitioner also submitted no supplemental Gomez declaration with its Reply. Thus, counsel’s new assertion that “Zheng’s timer” already performs the watchdog function is not supported by new expert analysis and cannot cure the Petition’s admission that Zheng identifies no such timer.

C. Section 42.65(a) and Federal Circuit Authority Require Underlying Facts and Reasoning

Under 37 C.F.R. §42.65(a), expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no

weight. The Federal Circuit likewise holds that conclusory expert testimony is inadequate to support an obviousness determination. TQ Delta, 942 F.3d at 1358-59. The Board is not required to accept such testimony merely because no counterexpert was offered. *In re Express Mobile*, 2024 WL 2818365, at *4.

Petitioner's own citation to *Xerox Corp. v. Bytemark, Inc.* cuts against Petitioner. There, the Board gave little weight to expert testimony that merely repeated the petition's conclusion without additional supporting evidence or technical reasoning. IPR2022-00624, Paper 9 at 15-17 (PTAB Aug. 24, 2022) (precedential). Here, Petitioner itself says Ex. 1005 "simply serves" to confirm the Petition, and the disputed Gomez opinions track the Petition's mappings rather than identify circuitry, source code, testing, or an express Zheng disclosure. Petitioner cannot invoke Xerox against Patent Owner while asking the Board to accept the same kind of confirmatory expert assertions Xerox discounted.

The principal Gomez opinions challenged here are precisely the gap-filling opinions for which the disclosed references provide no adequate foundation:

- Ex. 1005 ¶¶ 139-79 aggregate Zheng's transmitter and receiver into one sensor, then infer full-sensor power cutoff and coordinated dormancy from receiver-only power control.

- Ex. 1005 ¶¶ 194-217 assign the patent’s state labels to selected Zheng intervals and infer a lid hold and post-closing sleep transition that Zheng does not disclose.

- Ex. 1005 ¶¶ 219-91 construct an assumed timer cycle, select an undisclosed watchdog timer, and move Zheng’s 1.502 ms value into the claimed range.

- Ex. 1005 ¶¶ 299-306 infer the claimed front-can-edge geometry merely because a user walks up to a trash can.

These opinions are not measurements, circuit analyses, source-code reviews, or explanations grounded in an identified Zheng implementation. They are litigation mappings that bridge textual gaps by assuming the claimed arrangement. Under § 42.65(a) and TQ Delta, the Board should afford them little or no weight.

D. An Expert Cannot Create Disclosure by Applying Claim Labels After the Fact

Mr. Gomez’s declaration is most heavily used to rename Zheng’s intervals with the patent’s terminology. But the problem is not that Zheng lacks magic words. The problem is that Zheng lacks the claimed relationships. An expert may explain implicit technical understanding, but may not create a missing controller state, actor, causal branch, or wake mechanism simply by drawing boundaries around selected time periods.

The same is true of obviousness. General knowledge that watchdog timers existed may be relevant background, but the expert must still provide a reason tied to Zheng for selecting the watchdog timer and arranging it to wake the microcontroller from the claimed sleep state to the claimed working state. A conclusion that the modification would have been straightforward because watchdog timers were known is the type of hindsight reasoning TQ Delta rejects.

E. The Board Should Disregard Legal Conclusions and Unsupported Gap-Filling Opinions

Accordingly, Patent Owner respectfully requests that the Board disregard Ex. 1005 to the extent it: (1) offers ultimate legal conclusions of claim construction, anticipation, or obviousness; (2) treats Applicant's prosecution statements as defining working state to include every non-sleep condition; (3) supplies a watchdog timer not disclosed in Zheng; (4) equates inactivity with electrical power cutoff; (5) treats a receiver-only power interval as power control of the entire claimed active infrared sensor; (6) creates a multi-second lid delay or post-close sleep transition from convenience; (7) moves an out-of-range value into claims 5 and 6 without a recognized result-effective variable; or (8) supplies the precise geometry of claims 7-12 from the generic act of approaching a trash can.

At most, the declaration may receive weight for undisputed background propositions, such as the general existence of infrared components, microcontrollers,

and watchdog timers. Those generic propositions do not prove that Zheng or Wang discloses or renders obvious the claimed method.

XII. CONCLUSION

Petitioner has not carried its burden. The Reply does not establish that Zheng discloses the claimed microcontroller-controlled cutoff of power to the active infrared sensor, a working state reached after wake-up, a watchdog timer that performs that wake-up, the restore-stabilize-emit sequence of claim 2, the claimed timing relationships of claims 3-6, or the complete spatial relationship of claims 7-12. Wang does not cure the underlying method limitations. Mr. Gomez's unsupported and derivative opinions cannot substitute for those missing disclosures and should receive little or no weight on the disputed issues.

For the foregoing reasons, and for the reasons stated in the Patent Owner Response, the Board should determine that Petitioner has not proved claims 1-12 of the '796 patent unpatentable.

Dated: August 31, 2026

Respectfully submitted,

/Raymond Y. Chan/
Raymond Y. Chan
Reg. No. 37,484
Counsel for Patent Owner

CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. §42.24(d), the undersigned certifies that this Patent Owner Sur-Reply complies with the type-volume limitation of 37 C.F.R. §42.24(c)(4). This Sur-Reply contains 5348 words, excluding the parts exempted by 37 C.F.R. §42.24(a)(1).

Dated: August 31, 2026

/Raymond Y. Chan/
Raymond Y. Chan
Reg. No. 37,484
Counsel for Patent Owner
David & Raymond Patent Firm
108 N. Ynez Ave., Suite 128
Monterey Park, CA 91754
1.626.571.9812
1.626.571.9813
raymondcd@davidandraymond.com

CERTIFICATE OF SERVICE

The undersigned certifies that on August 31, 2026, a true and correct copy of the foregoing PATENT OWNER'S SUR-REPLY was served by electronic mail on counsel of record for Petitioner at the email addresses of record in this proceeding.

The following counsel of record for Petitioner were served:

Guangzhou EKO Trading Development Co., Ltd.:

K. Patrick Herman (P52PTABDocket@orrick.com)

Yufeng Ma (PTABDocketE81@orrick.com)

Joseph Chern (2JAPTABDocket@orrick.com)

Orrick, Herrington & Sutcliffe LLP

Dated: August 31, 2026

/Raymond Y. Chan/

Raymond Y. Chan

Reg. No. 37,484

Counsel for Patent Owner

David & Raymond Patent Firm

108 N. Ynez Ave., Suite 128

Monterey Park, CA 91754

1.626.571.9812

1.626.571.9813

raymondc@davidandraymond.com