

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

PETITIONER'S REPLY

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LISTING OF EXHIBITS

Exhibit	Description
1001	U.S. Patent No. 10,928,796 B2 to Wang et al.
1002	File History of U.S. App. 16/315,625
1003	CN 105525665 A to Zheng et al.
1004	Certified translation of CN 105525665 A to Zheng et al. and associated translator's declaration
1005	Declaration of Miguel Gomez
1006	U.S. Patent No. 9,382,067 B2 to Gropper
1007	U.S. Patent No. 7,896,196 B2 to Wegelin et al.
1008	U.S. Patent No. 7,690,623 B2 to Parsons et al.
1009	CN 203740427U to Wang et al.
1010	Certified translation of CN 203740427U to Wang et al. and associated translator's declaration
1011	U.S. Patent No. 8,766,195 B2 to Tang et al.
1012	U.S. Patent No. 8,421,020 B2 to Chen et al.

I. INTRODUCTION

Petitioner Guangzhou EKO Trading Development Co., Ltd. (“EKO” or “Petitioner”) submits this reply to Patent Owner’s Response (Paper 13).

Patent Owner does not dispute that Zheng operates in exactly the way described in the Petition. It admits that Zheng employs a “short power-on interval before ... sensing.” Response, 20. It admits that Zheng both emits and detects infrared sensor signals to control trashcan opening. *Id.*, 16. And it admits that Zheng has a “low-power operation” period. *Id.* Because of this, and just as Petition explained, Zheng undeniably includes the claimed “working state” (the period when the infrared sensor is powered but not emitting/detecting), a “standby state” (the period when the sensor is emitting/detecting), and a “sleep state” (the low-power state when a sensor power is cut-off).

Despite conceding that Zheng’s trashcan proceeds through these three different operational states, Patent Owner nonetheless attempts to distinguish Zheng from the claims. Patent Owner’s arguments lack merit.

Patent Owner begins by addressing claim construction. It argues that the ’796 patent’s claims require some sort of “specific architecture with meaningful state boundaries” not present in Zheng. *Id.*, 15. But, it then goes on to propose claim constructions that are not meaningfully different from those in the Petition. While Patent Owner next walks through almost every ’796 patent claim limitation, it does

little more here than issue bald, conclusory denials. Patent Owner never explains why Zheng does not fall within the claim scope. And it offers no evidence supporting what it says. Patent Owner did not depose Petitioner's expert, did not file its own expert declaration, and did not point to any other prior art that could provide insight into Zheng's operation. This does not show non-obviousness. If the claims are interpreted as they are in the Petition, Zheng discloses everything the claims require. Patent Owner's evidence-free and conclusory denials do nothing to change this.

II. ARGUMENT

A. **Patent Owner's Proposed Claim Constructions Fail to Distinguish the Prior Art**

Patent Owner begins its response with a lengthy discussion of the '796 patent and its claims. According to Patent Owner, the claims "do not merely recite generic periodic infrared sensing..." Response, 1. Instead, they "require a coordinated state-machine architecture" with "meaningful state boundaries." *Id.*, 1, 15. Patent Owner then goes on to propose definitions that purportedly "meaningful[ly]" differentiate the claimed states. Response, 14. Per Patent Owner, the "sleep" state is a "low-power condition in which the sensor power is cut off." *Id.* The "working" state is a "transitional and operational condition after wake-up and before or apart from standby detection." *Id.* And the "standby" state is a "detection condition in which the sensor emits a pulse." *Id.*

None of the constructions proposed by Patent Owner appear to be different than those set forth in and applied by the Petition. As explained in the Petition, in the “sleep state,” “the microcontroller cuts off power to the active infrared sensor.” Paper 1 (Petition), 9. In the “working state,” the “microcontroller is not sleeping” but is “suppl[ying] power to the active infrared sensor.” *Id.* And in the “standby state,” the “microcontroller causes the active infrared sensor to emit a signal for detection.” *Id.* This is indistinguishable from Patent Owner’s proposal. Both sets of constructions recognize that the “sleep” state covers the period when sensor power is cut off. Both constructions recognize that the microcontroller enters the “working” state after exiting sleep. And both constructions recognize that the “standby” state covers the period when the sensor is emitting/detecting. As explained in detail below (and as already explained in the Petition), Zheng teaches just this type of operation. The Board need construe terms “only to the extent necessary to resolve the controversy.” *Realtime Data, LLC*, 912 F.3d 1368, 1375 (Fed. Cir. 2019). Here, there is no controversy: Patent Owner’s constructions are not substantively different from those in the Petition. Because of this, its constructions do not distinguish the prior art.

Despite proposing constructions that are not meaningfully different, Patent Owner argues that the Petition’s constructions are “too broad” because they somehow “effectively turn working into every condition other than sleep.”

Response, 14. This, however, is exactly what the claims require: the “working” state is the inverse of the “sleep” state. The claims themselves make this apparent. Per claim 1, the microcontroller wakes “from the sleep state to the working state.” ’796 patent, claim 1. And the microcontroller “remain[s]” in this “working state if a reflection output signal is received from the active infrared sensor” before transitioning back to the “sleep state after the lid is closed.” *Id.* Because the microcontroller wakes into the “working” state and then “remain[s]” in this state during sensor emission, detection, and lid operation up until the time it goes back to “sleep,” the “working” state does in fact cover the entirety of the time period where the microcontroller is awake and not sleeping. If it did not, it would not be possible to “remain” in the working state as the claims require. An example of this operation is shown in the annotated version of Figure 2 of the ’796 patent below. As shown, the microcontroller wakes into the “working state” and remains in this state until it reenters the “sleep state”:

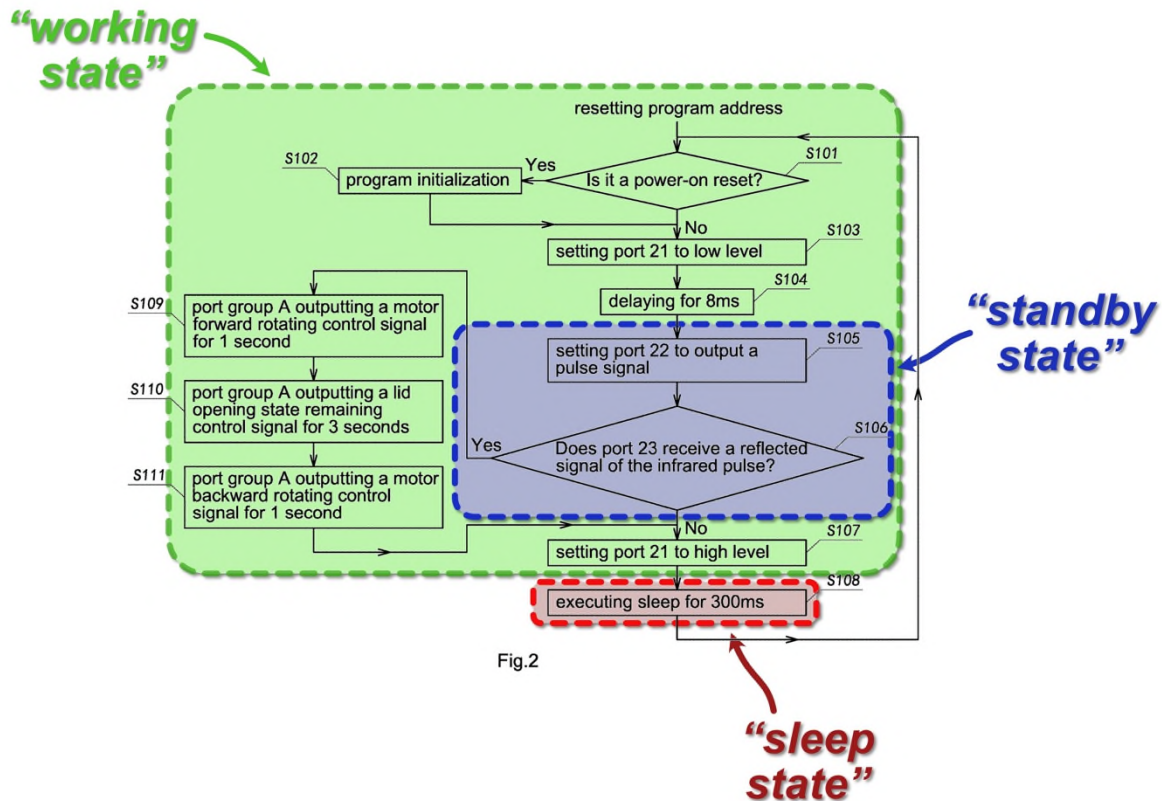


Fig.2

'796 patent, Fig. 2 (annotated); *see also* Petition, 7.

The rest of the intrinsic record is no different and characterizes the working state in this very same way. According to the specification, after being “woken up by the watchdog timer” from the sleep state, “the microcontroller will first restore the power supply of the active infrared sensor” allowing it to “enter a stable working state.” *Id.*, 2:35-42. Then, the trashcan “remain[s] in the working state” through the rest of its operation including sensor emission/detection and lid opening/closing. *Id.*, 2:24-30; *see also id.*, 4:34-48, 5:63-6:5. The patent also contrasts the “working state” with the “sleep state” (*id.*, 4:2-5) and explains that the trashcan’s power consumption is reduced because it is only “in the working state intermittently” (*id.*,

4:49-51). Likewise, during prosecution, Patent Owner characterized the “working” state as the “normal mode” or operation (*i.e.*, the state occupied when not sleeping). Ex. 1002, p. 170. So once again, the “working” state does in fact span the periods of operation when the trashcan is not sleeping. This includes the periods when the trashcan performs various operations, such as powering the infrared sensor, emitting/detecting signals, and opening/closing the trash can cover. The Petition did not interpret the claims too broadly. It applied an understanding of “working state” no different from that in the claims, specification, and prosecution history.

While Patent Owner’s response does not clearly say so, it is possible that it may alternatively be arguing that the ’796 patent’s claims are limited to a specific, physical “state-machine” or other hardware implementation like that discussed in the patent’s specification. *See, e.g.*, Response, 1 (noting that the claims require “a coordinated state-machine architecture”), 6 (“the invention is built around” a “specific state-machine architecture”), 20 (referring the “state-machine limitations” purportedly present in claim 1), 24 (again referencing a “defined state-machine sequence”). The claims of the ’796 patent, however, are method claims not apparatus claims. And they make no reference to any specific type of “state-machine,” let alone one that includes the same structure as the example in the ’796 patent’s specification. Thus, the claims cannot be properly limited to such a structure. *See Promptu Sys. Corp. v. Comcast Corp.*, 92 F. 4th 1372, 1379 (Fed. Cir.

2024) (“features recited in the specification merely as aspects of embodiments, and not expressly or even implicitly identifying requirements of the invention, do not narrow a claim term that is otherwise broader in its ordinary meaning.”); *see also Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004) (similar).

B. Zheng Renders the Claims Obvious

Zheng renders all the ’796 patent claims obvious regardless of whether Petitioner’s or Patent Owner’s claim constructions are adopted.

1. *There Is No Dispute Regarding How Zheng Operates*

Patent Owner appears to **admit** that Zheng operates exactly as described in the Petition. The Petition discussed Zheng in detail. *See, e.g.*, Petition, 13-19. It began by explaining that Zheng teaches an “automatically” opening trashcan controlled by a “microcontroller unit.” *Id.*, 13-14 (citing Zheng, [0004], [0036]-[0037]). The microcontroller employs an “infrared” sensor to determine whether the trashcan’s cover should be driven open with a motor. *Id.*, 14-15 (citing Zheng, [0036]-[0037]). The Petition also noted that Zheng’s trashcan is controlled in a way that “reduces” its “energy consumption.” *Id.*, 14 (citing Zheng, [0066]). To facilitate this, Zheng teaches that its infrared sensor is “powered on in advance” of use for a short “third preset time,” only remains “powered on” for another “fourth preset time” to facilitate detection, and then enters a lengthy un-powered “dormancy mode” if nothing is

detected. *Id.*, 17-18 (citing Zheng, [0065]-[0066], [0101]-[0102], [0113]). The Petition included a figure summarizing this disclosed operation. *See id.*, 18.

None of this is in dispute. Patent Owner admits that Zheng's trashcan is intended to satisfy "broadly similar goals" to those discussed in the '796 patent (*i.e.*, reduced power consumption). Response, 16. Patent Owner also admits that Zheng's trashcan employs a "short power-on interval before" its initial "sensing step." *Id.*, 20. Patent Owner admits that after this power-on, Zheng engages in "[i]nfrared transmission" and "detection." *Id.*, 16. And finally, Patent Owner admits that Zheng employs "some form of low-power operation," including a "dormancy mode" where Zheng's "components do not work" and are "turned off after a period." Response, 16, 18-19.

This should end the analysis. Zheng admittedly includes the three states required by the claims: a "working" state (the time when the microcontroller powers Zheng's sensor, including a short power-on interval), "standby" state (the period where infrared transmission/detection occur), and a "sleep" state (dormancy, when Zheng's components are turned off and do not work).

2. Zheng Discloses All the '796 Patent's Claim Limitations

Despite both proposing claim constructions matching those in the Petition and conceding that Zheng operates in the way the claims require, Patent Owner spends pages of its response trying to identify differences between Zheng and the claims.

Patent Owner’s primary complaint appears to be that the Petition “renames Zheng’s operation to fit the claim language....” Response, 2; *see also* 16 (arguing that the Petition relies on “relabeling and inference”), 39 (noting that the Petition “[a]dopts the challenged patent’s vocabulary and projects it back onto Zheng”). But anticipation is “not an ‘*ipsissimis verbis*’ test.” *In re Bond*, 910 F.2d 831, 832 (Fed. Cir. 1990). The prior art “need not disclose” required claim “elements in the very same terms used by the patent.” *Adasa Inc. v. Avery Dennison Corp.*, 55 F.4th 900, 910 (Fed. Cir. 2022). Thus, whether the ’796 patent’s claim language—including the words “working,” “standby,” and “sleep”—appears verbatim in Zheng is of no importance. All that matters is that Zheng performs the claimed method. It does.

Next, Patent Owner’s Response is accompanied by no evidence at all: Patent Owner did not file an expert declaration and points to no other prior art elaborating on how a POSITA would have understood either Zheng or the ’796 patent. It did not even take the deposition of Petitioner’s expert declarant. Thus, it presents nothing more than unsupported attorney argument. “[A]ttorney argument is not evidence.” *Icon Health & Fitness, Inc. v. Strava, Inc.*, 849 F.3d 1034, 1043 (Fed. Cir. 2017); *see also Parkervision, Inc. v. Vidal*, 88 F.4th 969, 982 (Fed. Cir. 2023) (“attorney argument ... fails to undermine the evidence” from the prior art and petitioner’s expert). Moreover, this attorney argument does not even meaningfully explain why Zheng does not satisfy the claims. Instead, Patent Owner repeatedly limits itself to

bald, conclusory, and unsupported denials. This does not show non-obviousness. *See Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 15 (P.T.A.B. Aug. 22, 2022) (precedential) (“conclusory assertion[s]” are “entitled to little weight”).

The little that Patent Owner does say fails to account for either its own claim constructions or Zheng’s disclosure. Each limitation (or dependent claim) addressed by Patent Owner is discussed below:

“Standby state”: Patent Owner argues that Zheng lacks a “distinct” standby state that is “coordinated” with two other states the claims require. Response, 17. However, that is exactly what Zheng teaches. As Patent Owner’s own claim construction recognizes, the “standby” state is simply when “pulse emission and detection occur.” *Id.*, 6. Zheng’s trashcan operation method includes periods of time when infrared signals are both emitted and detected. In particular, Zheng’s trashcan’s “microcontroller” “control[s]” an infrared sensor that includes both “an infrared transmitting tube” (to emit an infrared signal) and an “infrared receiving tube” (to detect a reflected signal). Zheng, [0036]-[0042], [0050]-[0063]; *see also* Petition, 21-24.

Moreover, Zheng’s infrared sensor emission/detection occurs at set, designated times. Per Zheng, its trashcan employs a specific “trash bin control method.” *Id.*, [0006]. And, as part of this method, infrared signals are emitted/detected at pre-programmed times during steps S101 through S103. *Id.*,

[0051], [0058]-[0059]; *see also id.*, [0005]-[0010] (noting that emission/detection occurs at “preset time[s]”). So, Zheng not only includes a “standby state” (the period during its trashcan’s operation where infrared emission and detection occur), but this state is in fact both distinct and coordinated: signals are emitted and detected following a specific, programmed timing.

“Sleep state”: Patent Owner next contends that Zheng lacks a “sleep state” where the “microcontroller cuts off a power of the active infrared sensor.” Response, 18-19. According to Patent Owner, the Petition “never points to a disclosure in Zheng that the microcontroller ... actively cuts off the sensor’s power supply.” *Id.* Patent Owner posits that this is purportedly a problem because, rather than cutting sensor power, Zheng allegedly could “suspend transmission, pause detection, or otherwise cease active sensing.” *Id.*

But Zheng does teach that sensor power is cut-off. According to Zheng, the microcontroller “control[s] the infrared receiving tube to be powered on” and then “maintain[ed]” in this “powered on” state for a certain “preset time.” Zheng, [0027]; *see also* [0012], [0065], [0086], [0102]. Because Zheng’s sensor is powered on and remains powered for only a limited time, it follows that the sensor must also be powered off. Zheng itself says as much, explaining that its infrared sensor is not “turned on all the time” and is “turned off” when not in use. *Id.*, [0066]; *see also* Petition, 24-27. Indeed, even Patent Owner appears to recognize this, admitting that

in Zheng, the “infrared receiving tube is not turned on all the time, may be periodically turned on, and may be turned off...” Response, 18 (emphasis added).

This is not even the totality of Zheng’s disclosure. Zheng also explains that its trashcan control method includes a “dormancy mode” where its infrared transmitting and receiving tubes “do not work” for purposes of “saving ... power.” Zheng, [0113]. Upon exiting this dormancy mode and resuming normal operation, Zheng states that its infrared sensor is “powered on.” *Id.*, [0065]. Because Zheng’s sensor (1) is not always powered, (2) enters a dormancy mode when not in use for purposes of saving power, (3) is off when in dormancy, and (4) must be powered on upon exiting dormancy and before use, the Petition explained that a POSITA would have understood that Zheng includes the claimed “sleep state” where the “microcontroller cuts off a power of the active infrared sensor.” *See* Petition, 24-27. Patent Owner does not address this collective disclosure. Instead, it limits itself to speculating about other, alternative ways that Zheng may be operating. But the mere fact that there may be ways to configure Zheng that are different from what Zheng discloses (*i.e.*, a method where the sensor is periodically powered on and off) does not establish non-obviousness. *See In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004) (mere existence of alternatives does not negate prior art’s other teachings)

None of the other arguments Patent Owner makes serve to distinguish Zheng either. Patent Owner makes repeated reference to the way the example embodiment

in the '796 patent cuts the power of its infrared sensor. *E.g.*, Response, 18 (noting that the “power supply to active infrared sensor is controlled through a transistor path such that the microcontroller can cut off power entirely when entering sleep”). It is the claims, however, that define the scope of invention. The prior art is not required to employ the same example structure set forth in the specification. *See generally KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 419 (2007) (“[w]hat matters is the objective reach of the claim”). Here, the claims do not require that power be cut off in the sleep state any specific way by any specific structure. Thus, Zheng, which teaches that sensor power is cut off during dormancy, satisfies the claims.

Patent Owner also argues that in Zheng “only the receiving tube” power is cut-off. Response, 40. There is purportedly no “express disclosure that the claimed active infrared sensor, as a whole, is power-cut off in the claimed sleep state.” *Id.* This both misunderstands the claims and Zheng’s operation. The claims here require only that the “microcontroller cut[] off a power of the active infrared sensor.” ’796 patent, claim 1. The claim is satisfied by any power cut-off. It is not necessary to remove power to the sensor “as a whole” as Patent Owner appears to argue. Again, this is exactly what Zheng does: power to its infrared receiving tube is cut-off at certain periods of operation. *See* Zheng, [0027]; *see also* [0012], [0065], [0086], [0102]. In any event, even if this were required, Zheng explains that both its

“infrared transmitting tube and the infrared receiving tube” “do not work” for purposes of “saving ... power” when in the “dormancy mode.” *Id.*, [0113].

“Working state”: Patent Owner argues that Zheng lacks the claimed “working state” because it purportedly “[d]oes not teach” “a separate controller state, much less one that is reached after wake-up from sleep and before reentry into standby.” Response, 20. More specifically, Patent Owner alleges that Zheng’s “short pre-power interval is not the same as the claimed working state.” *Id.*, 41.

Zheng includes the claimed “working state.” There is no difference between Zheng’s operation and what the ’796 patent’s claims require. Zheng specifically explains that “before step S101” (the step when Zheng’s sensor first emits an infrared signal), the “infrared receiving tube” is “powered on in advance of a third preset time” of “1.502 milliseconds.” Zheng, [0066]. Then, the sensor remains “powered on for a fourth preset time” of “2.104 milliseconds” (even though it is emitting signals for only part of this time period). *Id.*, [0064]-[0066]. Per Patent Owner, the “working state” is a “transitional and operational condition after wake-up and before or apart from standby detection.” Response, 14. Even if Patent Owner is correct that the “working state” cannot include the “standby state” (to be clear, Petitioner does not agree), this is what Zheng does: its infrared sensor is powered for 1.5 milliseconds after emerging from dormancy and before infrared signals are

emitted/detected. *See* Petition, 27-32, 34-38 (discussing the powering of Zheng’s sensor during a “working state”).

Patent Owner’s motivation to combine argument also lacks merit. Patent Owner disputes that it would have been “obvious to modify Zheng so that it also had the claimed sleep state, working state, standby state, power cutoff, and watchdog wake-up.” Response, 22. But Zheng itself teaches a method with these various claimed “states.” Given that Zheng already operates in the way the claims require, it does not need to be modified. Nor was it necessary for the Petition to articulate a motivation to employ functionality that Zheng already says its trashcan includes. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1372-73 (Fed. Cir. 2019) (stating that no “finding regarding a motivation to combine” is required when a single reference discloses the claims); *Gen. Elec. Co. v. Raytheon Tech. Corp.*, 983 F.3d 1334, 1352 (Fed. Cir. 2020) (holding that it is not necessary to “explain why an artisan would be motivated to use each element” already disclosed in the prior art).

“Watchdog timer”: Patent Owner next argues that Zheng lacks the claimed “watchdog timer.” Here, Patent Owner characterizes Zheng as “merely” including “timing.” Response, 21. It also disparages the Petition as purportedly only pointing to “knowledge that a component existed.” *Id.*, 21-22.

This fails to account for the totality of Zheng’s disclosure. As explained in the Petition, Zheng employs a microcontroller to control operation of its trashcan.

See Petition, 38-39 (citing Zheng, [0037]-[0043]). This microcontroller ensures that Zheng’s infrared sensor is powered, emits and detects signals, and enters and exits dormancy at regular, periodic, and specifically timed intervals. *See id.* Moreover, the Petition explained—with supporting citation to both an expert declaration and example prior art references—that watchdog timers were known to be used with microcontrollers to allow for this very type of operation. *See* Petition, 39-41. As explained, watchdog timers were not only routinely used to control the on/off operation of sensors but were employed in products that are analogous to the ’796 patent’s trashcan. *See id.* (discussing the use of watchdog timers in products that monitor waste container fill levels, employ infrared sensors to detect hand proximity, and use sensors to activate products like automatic faucets). The Petition explained that this would have both motivated the use of such a timer with Zheng and provided a POSITA with a reasonable expectation of success. *See id.*, 41-42.

Patent Owner does not dispute any of this. It does not dispute that watchdog sensors were well known prior to the filing of the ’796 patent. It does not dispute that watchdog sensors were routinely used to control the sleep/wake behavior of infrared sensors in consumer products. It also does not dispute the Petition’s contentions regarding why a POSITA would have been motivated to employ a watchdog timer with Zheng and expected to succeed when doing so. Instead, it limits itself to just conclusory denials that Zheng includes a “watchdog timer.” *See*

generally Response, 21-22, 40-41. This type of non-responsive and unsupported denial does not support non-obviousness. *See generally* Xerox, IPR2022-00624, Paper 9 at 15. Moreover, it fails to account for the '796 patent itself. While the patent purports to employ a “watchdog” timer, it says nothing about this element beyond the fact that it is used. No importance is attributed to the use of this type of timer versus any other. *See, e.g.*, '796 patent, 3:36-37 (“[t]he microcontroller has a sleep function and a watchdog timer”), 4:11-12 (noting that the “watchdog timer” wakes the microcontroller after “300 ms”). And Zheng’s timer performs the very same function in the same way as that in the '796 patent: both Zheng and the '796 patent employ a timer that wakes a microcontroller after a timed period of sleep/dormancy. *Compare id.* with Zheng, [0050]-[0066] (noting that Zheng wakes its microcontroller, keeps its sensor powered, and then enters dormancy at fixed times).

“Active infrared sensor”: Patent Owner also appears to argue that Zheng merely includes “separate optical elements” rather than the claimed “active infrared sensor.” Response, 38. Once again, this fails to account for both the prior art and the Petition. Zheng includes both an “infrared transmitting tube” and “infrared receiving tube” that are not only co-located “close to each other” on Zheng’s trashcan but cooperate to detect an approaching “person or object.” Zheng, [0043], [0103]. Moreover, the Petition explained at length (with both expert declaration and other

prior art disclosure support), why a POSITA would have considered this structure to constitute the claimed “active infrared sensor.” *See* Petition, 21-22. Just as it did when addressing other claim limitations, Patent Owner failed to meaningfully dispute this. It does not dispute that a POSITA would have recognized that an “active infrared sensor” is typically comprised of co-located infrared transmitting and receiving tubes just like that in Zheng. And it offers nothing—beyond a conclusory denial—in response to the Petition’s arguments and evidence.

Dependent Claim 2: Among other things, this claim requires “delaying for a preset threshold time for the active infrared sensor to enter a stable working state” after power is restored to the sensor. ’796 patent, claim 2. Patent Owner argues that the fact that Zheng includes a “pre-detection power-on interval” “is not enough[.]” Response, 23. While Patent Owner appears to concede that “a skilled person could infer that a brief power-on interval might help with stabilization,” it argues that Zheng still lacks a “threshold delay as part of a defined state-machine sequence...” *Id.*, 24. It is not clear from this what Patent Owner contends is missing from Zheng. Zheng teaches that its trashcan control method powers on the sensor, waits for a “preset time,” emits signals during another “preset” time interval, and then enters a timed “dormancy” mode. Zheng, [0051]-[0054], [0064]-[0066]. Thus, Zheng does in fact employ the claimed power on, stabilize, emit/detect, and sleep sequence the ’796 patent’s claims require. *See generally* Petition, 42-44. Simply stating that

Zheng does not do this—without explaining why or providing any evidence—does not show non-obviousness.

Dependent Claims 3-6: Patent Owner points to no additional missing limitations when addressing these dependent claims. Instead, it simply refers back to its claim 1 and 2 arguments to allege that Zheng lacks the claimed multi-state “architecture.” *See* Response, 24-26. This argument fails for the same reasons discussed above. *See supra* discussion of claims 1-2.

Dependent Claims 7-12: These claims require an “induction area” that is “arranged above the induction window ... located on the front edge of the trash can.” ’796 patent, claim 7. The Petition argued that this would have been obvious in view of either Zheng itself or the combination of Zheng and Wang. *See* Petition, 47-52.

As explained in the Petition, Zheng itself teaches what these claims require because its infrared sensor is configured to detect a user who “walks up” to the trashcan. *See* Petition, 47-48 (citing Zheng, [0004], [0043], [0054], [0063], [0114].) The Petition went on to explain that given this functionality, the most obvious place to arrange Zheng’s “induction window” (the portion of its sensor that emits a signal) and “induction area” (the area where infrared signal reflection is detected) is at the front edge of the trashcan. *See* Petition, 48-49. Patent Owner faults the Petition for relying exclusively on “common-sense rhetoric” to show where these structures would be located. *See* Response, 26-27. This is not what the Petition did. Rather

than relying only on “common sense” it pointed to Zheng’s description of its trashcan’s operation (it is designed to automatically open when it detects an approaching user) and explained that this description would have led a POSITA to conclude that Zheng’s sensor is structured and located in the way the claim requires. *See* Petition, 48-49. The Petition also supported this with expert testimony. *See id.* (citing Ex. 1005, ¶¶ 299-306). In contrast, Patent Owner provides nothing in response. It cites no expert testimony or other example prior art references locating sensors elsewhere. Indeed, it does not even explain where Zheng’s sensor could alternatively be located (besides the trashcan’s front) to achieve the same functionality described. *See generally id.* Once again, this type of bald, conclusory, and unsupported denial is irrelevant, non-responsive, and does not show non-obviousness. *See generally Xerox*, IPR2022-00624, Paper 9 at 15.

Patent Owner’s argument regarding the combination of Zheng and Wang is no better. Patent Owner does not dispute that Wang discloses the “physical placement recited in claims 7-12.” Response, 27. Instead, it argues that Wang “fails to provide any meaningful teaching” about the “three-state control architecture” required by the claims. *See id.* The Petition, however, relies only on Wang’s disclosure of sensor location. *See* Petition, 49-52. Zheng itself already teaches the method of claim 1. Patent Owner is responding to an argument the Petition never made.

3. Patent Owner's POSITA Definition Confirms that the Claims Are Obvious

Patent Owner's substantive arguments are not the only place it goes awry. It also sets the level of skill possessed by a POSITA far too high. According to Patent Owner, a POSITA would be "skilled in the field of low-power control systems for battery-operated sensor-and-motor consumer devices." Response, 12. This POSITA would also purportedly "understand that a system may require a distinct powered-but-not-yet-detecting phase to stabilize a sensor before reliable pulse emission and detection can occur." *Id.* A POSITA need only have ordinary—not extraordinary—skill. *E.g., Environmental Designs Ltd. v. Union Oil Co.*, 713 F.2d 693, 697 (Fed. Cir. 1983) (a POSITA does not need to be a "genius[] in the art at hand"). The '796 patent identifies its "field" as "power-saving methods for the standby circuit of an induction trash can." '796 patent, 1:20-21. Thus, a POSITA is only required to possess typical knowledge in this field, not the very specific and targeted knowledge Patent Owner requires. *See generally* Ex. 1005, ¶ 13. Even if accepted, however, Patent Owner's POSITA definition does little more than confirm that the claims are obvious: Patent Owner's more knowledgeable POSITA would plainly recognize that Zheng's power-saving trashcan is designed to include the very same sleep, working, and standby states the '796 patent's claims require.

C. Petitioner's Expert Is Qualified and Offers Relevant Testimony

Patent Owner also wrongly argues that the declaration of Petitioner's expert—Miguel Gomez—"is entitled to little weight." Response, 30. Patent Owner does not dispute that Mr. Gomez qualifies as a POSITA. It also does not dispute that he possesses technical expertise in the field of the '796 patent (Mr. Gomez is an electrical engineer with years of experience designing electronic control systems). *See* Ex. 1005, ¶¶ 5-22. Instead, Patent Owner's only complaint is that Mr. Gomez is not "a patent practitioner." Response, 31. This is not relevant. Mr. Gomez's declaration provides technical insight into the '796 patent's subject matter and the disclosure in the prior art. He has not been offered as (and does not purport to be) a patent law expert. Mr. Gomez's technical background indisputably qualifies him to testify. *See, e.g., Sundance, Inc. v. DeMonte Fabricating Ltd.*, 550 F.3d 1356, 1663-64 (Fed. Cir. 2008) (a "witness ... qualified in the pertinent art" may testify regarding a POSITA's knowledge, anticipation, and obviousness).

III. CONCLUSION

For the reasons explained above—and in the Petition—the '796 patent's claims are all unpatentable as obvious.

Respectfully submitted,

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Dated: July 21, 2026

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CERTIFICATE OF WORD COUNT

The undersigned certifies that the foregoing reply complies with the type-volume limitation in 37 C.F.R. § 42.24. According to the utilized word-processing system's word count, the reply contains 5,034 words.

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CERTIFICATE OF SERVICE

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