

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

WIRTGEN AMERICA, INC.,
Petitioner,

v.

CATERPILLAR INC.,
Patent Owner.

Case No. IPR2022-01397
Patent No. 9,975,538

PATENT OWNER'S SUR-REPLY

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I. INTRODUCTION

Petitioner does not dispute the particular steps that are involved in Xing's method. Nor does Petitioner dispute that Xing's load power requirement, P_{load} , the parameter Xing relies on for determining the target engine speed, does not constitute the claimed "engine load." Instead, Petitioner's argument centers on whether Xing's measurement of a current engine power, P_{engine} , to indirectly derive P_{load} means that Xing's speed adjustment is "based on" P_{engine} , and whether Xing's candidate speed-torque pairings are efficiency points that provide "optimum engine speeds for different engine loads."

Petitioner's reply fails to substantiate the petition's arguments that Xing's fuel-efficiency method discloses these limitations. While Petitioner tries to twist Caterpillar's arguments into alleged "unarticulated claim constructions" (Reply, 4), Petitioner resorts to its own shaky positions on the alleged meaning of the claims, advancing interpretations that only cloud, and even eviscerate, the claim terms' meaning. These issues also carry over to dependent claim 13, where Petitioner's theory that Xing discloses the claimed clutch that "disengage[s] the rotor from the engine" relies on reading that limitation out of the claim, and its alternative reliance on Laux fails remedy this deficiency.

For these reasons, and as discussed in more detail below, the Board should find that Petitioner has not met its burden to prove that the challenged claims of the '538 patent are unpatentable.

II. ARGUMENT

A. Petitioner Fails to Show Xing Discloses Adjusting An Engine Speed “Based on” the Determined Engine Load

While the petition failed to identify with particularity what aspect of Xing Petitioners alleged constituted the claimed “engine load,” Petitioner now admits that it cannot be Xing’s load power requirement (P_{load}), leaving only the current engine power (P_{engine}) for its contentions. Reply, 4 (“ P_{engine} is the measured current engine load”), 9 (“the determined engine load (P_{engine})”); *see also* POR, 10-14 (citing EX2003, 52:3-11). However, as highlighted in the response, any current engine power (P_{engine}) determined in Xing fails to satisfy the limitations of the claims because Xing’s method adjusts its engine speed based on the load power requirement (P_{load}), not the current engine power (P_{engine}). POR, 14-19. In trying to avoid this issue, Petitioner’s reply attempts to frame Caterpillar’s arguments as dependent on claim construction, but it is Petitioner who must rely on the indefensible argument that Xing somehow adjusts an engine speed based on the determined engine load (P_{engine}) simply because P_{engine} is a variable that may be used to calculate the load power requirement P_{load} .

For the reasons below, Petitioner fails to meet its burden in showing that Xing discloses adjusting an engine speed based on the determined engine load.

1. Petitioner resorts to fabricating claim construction positions that Caterpillar did not take

A central theme to Petitioner’s reply is an allegation that Caterpillar’s arguments amount to advancing constructions of the challenged claims. *See, e.g.*, Reply, 1, 5-6, 11-13. For instance, Petitioner portrays Caterpillar as arguing that the claims require “the engine load to be explicit in the calculation that returns the determined engine speed” and “multiple ordered steps” that Petitioner must construct from an illustrative point made in the response.¹ Reply, 6, 11 (citing POR, 14-15). Contrary to Petitioner’s contentions, however, Caterpillar’s arguments are rooted in the plain language of the claims.

Specifically, the claims do indeed recite the “two inputs” Petitioner acknowledges as part of its method. *E.g.*, Reply, 1, 5. As Caterpillar explained,

¹ Petitioner also takes inconsistent positions on Caterpillar’s arguments. For example, Petitioner alleges, on the one hand, Caterpillar’s arguments “impermissibly read[] limitations from preferred embodiments” into the claims (Reply, 5), but, on the other hand, find no support in the specification (*id.*, 7-8, 10-11).

the claims specify the particular form of the inputs (*i.e.*, the determined engine load and a specific type of predefined efficiency points) and the particular effect of those inputs in the method (*i.e.*, an adjustment of an engine speed “based on” the inputs). POR, 14-24. As explained below, while Petitioner seeks to diminish the claims to just the mere presence of an engine load and the adjustment of an engine speed (*infra*, section II.A.2), Xing’s method fails to disclose these two inputs as recited in the challenged claims and Petitioner’s reply arguments fail to rebut this conclusion.

2. Xing’s Equation 1 fails to support Petitioner’s position that Xing’s speed adjustment is based on P_{engine}

Petitioner’s theory that Xing discloses adjusting an engine speed based on the engine load is premised entirely on Xing’s Equation 1, where $P_{\text{engine}} = P_{\text{load}} + P_{\text{loss}}$. Reply, 2-4. According to Petitioner, merely because this relationship can be exploited as a means to indirectly determine P_{load} (which Xing uses to make its speed adjustment, *see* EX1006, 10:16-18), then this must mean that the adjustment made to engine speed in Xing’s fuel-efficiency method is “based on” the engine load (*i.e.*, P_{engine} , according to Petitioner). Petitioner’s arguments relying on this relationship fail for several reasons.

First, Petitioner attempts to demonstrate alleged flaws in Caterpillar’s analysis by “[e]xpress[ing] mathematically” Xing’s algorithm using a generic mathematical function. Reply, 7-8 (asserting “Engine Speed = P_{load} % efficiency

points,” where “ $P_{\text{load}} = P_{\text{engine}} - P_{\text{loss}}$ ” and “% is used as a generic placeholder for any mathematical function”). Petitioner uses this function to argue that because P_{load} can be calculated from $P_{\text{engine}} - P_{\text{loss}}$, then Xing’s speed adjustment is “based on” P_{engine} as it is recited in the challenged claims. However, similar to the superficial analysis advanced in the petition, Petitioner’s reply argument again employs an overly reductionist approach to Xing’s method.

As an initial matter, Xing’s method involves numerous steps and calculations to identify the engine speed at which to adjust the engine and, among those steps, Xing relies on only one parameter as the constant for adjusting the engine speed: the load power requirement, P_{load} . POR, 17. Further, in contrast to P_{load} , which Xing holds as constant, Xing teaches that other parameters, including the engine load, vary as the system determines which speed-torque combination to utilize to achieve the load power requirement. *Id.*, 19. Thus, Petitioner’s attempt to reduce Xing to a generic mathematical expression does not accurately reflect the method of Xing; instead, it only serves to circumvent Petitioner’s burden in showing that the method *as disclosed in Xing* meets the claim limitations.

Moreover, even if accepted at face value, Petitioner’s simplistic analysis results in an illogical reading of the term “based on.” For instance, the indirect determination of P_{load} involves calculating the difference between current P_{engine} (what Petitioner now maps to the determined engine load) and current P_{loss} .

Current P_{loss} , in turn, is estimated from stored component efficiency data, which depends on current vehicle operating parameters. *See* EX1006, 9:44-53, 10:53-67, FIGS. 6-10 (illustrating operating parameters such as engine speed and axle temperature). Similarly, current P_{engine} is calculated from the measurement of current engine speed and current engine torque. *See id.*, 9:37-44. Under Petitioner’s theory, Xing’s method adjusts the engine speed “based on” all of these parameters. Yet it would be illogical to conclude that Xing adjusts the engine speed based on the current power loss P_{loss} or even the current engine speed, the very factor Xing seeks to optimize.² Just as with P_{engine} , these parameters merely serve as a means to an end in Xing—the determination of P_{load} , which is the basis for which Xing adjusts its engine speed.

The slippery slope created by Petitioner’s analysis does not appear to be lost on Petitioner. According to Petitioner’s interpretation, “[a]lthough the plain and ordinary meaning of ‘based on’ may include some limit to the number of layers between the calculation returning the output (engine speed) and the recited input (engine load), one layer of separation cannot be seen as defeating the ‘based on’ requirement.” Reply, 8. In other words, Petitioner advances its own nebulous

² Indeed, following Petitioner’s reasoning, this would extend to any variables involved in the vehicle’s operation whether determined by the system or not.

claim construction: an indirect relationship is enough to satisfy the claims (irrespective of how the method actually evaluates the parameters) so long as only “one layer of separation” exists, but at some, unspecified number of layers, it becomes too indirect to satisfy the claim term.³ Such an interpretation only highlights Petitioner’s oversimplistic approach to the method disclosed by Xing.

Perhaps recognizing its own questionable logic, Petitioner attempts to justify its interpretation by arguing that Xing only relies on P_{load} as “the explicit parameter” because it “is used to refine the engine load to provide a more meaningful input to the calculation.” Reply, 8-9 (referring to P_{load} as “[a] more data-rich load parameter”). However, aside from Petitioner’s lack support for this assertion (*see id.* (citing EX1001, 1:36-50, which provides general discussion of the prior art), Petitioner’s expert testified that P_{load} is less than the engine load, making it unclear how P_{load} can “refine” the engine load and make it “more data-

³ Even to say there is only “one layer of separation” is an oversimplification. As noted above, Xing’s method involves numerous steps and calculations between “the recited input (engine load)” and “the output (engine speed),” and only with Petitioner’s own abstract function (*i.e.*, “ $a = b \% c$ ” and “ $b = x \% y$ ”) can it be argued to be “one layer of separation.”

rich” when P_{load} includes less information, because the loss component has been removed from the engine load value. *See* EX2008, 52:3-11; POR, 11.

Lastly, Petitioner attempts to reduce Caterpillar’s arguments to a matter of embodiments. In particular, Petitioner argues that Xing discloses two embodiments in which a current P_{load} can be determined, one in which it is calculated through Equation 1 and another where it is measured directly. Reply, 9. According to Petitioner, because Xing’s indirect embodiment measures an engine load (*i.e.*, P_{engine}), it does not matter that “some embodiments may not rely on the engine load,” “[t]he obviousness analysis only requires that Xing disclose using the current engine load, even if only in one embodiment.” *Id.*, 9-10. Petitioner then faults Caterpillar’s expert, Dr. Kemal, as failing to “evaluate the full teachings of Xing, believing the embodiment disclosing using the current P_{engine} to be irrelevant.” *Id.*, 10.

To be clear, neither Caterpillar nor its expert asserted that Xing’s embodiment where P_{load} is calculated indirectly through Equation 1 is irrelevant to the obviousness analysis. Instead, as Dr. Kemal explained, *even in* instances where P_{load} is indirectly derived through measurement of P_{engine} , Xing’s method fails to satisfy the challenged claims. This is because Xing’s method adjusts the engine speed to achieve the **load power requirement**, and the measured engine load (P_{engine}) is inconsequential to Xing’s speed adjustment. *See, e.g.*, POR, 14, 18-

19; EX1028, 85:22-87:13 (noting, for even indirect calculation of P_{load} , Xing still aims to control P_{load}), 103:4-104:18 (referring to paragraph 44 of declaration), 109:4-112:10 (acknowledging indirect embodiment, but testifying that P_{load} remains the basis for Xing's speed adjustment). As Caterpillar observed, the fact that Xing's method for adjusting the engine speed can be equally performed using the same steps *without* ever measuring P_{engine} provides additional evidence that Xing's speed adjustment is not "based on" any P_{engine} measured in Xing's indirect embodiment. POR, 18. Nevertheless, to be clear, even if Xing's indirect Equation 1 embodiment were the only method disclosed in Xing for determining P_{load} , Xing's speed adjustment would still fail to be "based on" the measured P_{engine} . To conclude otherwise must ignore the entire purpose of Xing's fuel-efficiency method, which is to (1) determine the output of useful work (*i.e.*, P_{load}) needed by the vehicle, and (2) "determine which combination of engine operating parameters," including engine load, that "may be utilized to achieve the vehicle's load requirement." EX1006, 10:16-22, FIG. 4; *see also* EX2001, ¶¶45-55.

3. Xing's candidate parameters further confirm that Xing's speed adjustment is not "based on" the determined engine load

As further noted in the response, Xing's identification of candidate engine parameters as part of its method further highlights that Xing's speed adjustment is not based on the determined engine load (*i.e.*, current P_{engine}). POR, 19.

Specifically, Xing’s method treats both engine speed and engine torque (and therefore engine power) as variable candidate parameters that are compared to identify the target engine speed at which to adjust the engine to achieve P_{load} , demonstrating that Xing’s speed adjustment is made independent of, and therefore not “based on,” the determined engine load (*i.e.*, measured P_{engine}). *Id.* (citing EX2001, ¶55).

In reply, Petitioner essentially advances the same reasoning as above—namely, simply because measurement of current P_{engine} may be used to calculate P_{load} , then any subsequent speed adjustment must be “based on” the measured P_{engine} . Reply, 14-16 (“Thus, Xing discloses the current engine load as a parameter in the algorithm.”). However, as explained above, such reasoning oversimplifies Xing’s method and fails to give weight to the “based on” language of the challenged claims. *Supra*, section II.A.2.

Further, to advance its baseless argument, Petitioner misleadingly asserts that “Dr. Kemal admitted that in [some] embodiments, the table in Xing Fig. 5 would replace the projected parameters (e.g., P_{load}) with the current parameters (e.g., engine load).” Reply, 15-16 (citing EX1028, 122:6-21; EX1006, 10:33-41). Dr. Kemal did not testify that in Xing’s FIG. 5, the projected P_{load} can be replaced with the current engine load. Instead, Dr. Kemal merely agreed that Xing states that, instead of using the forecasted load power requirement P_{load} as the basis for

determining the candidate engine parameters, a current load power requirement P_{load} may be used following the same method. EX1006, 10:33-38 (“It should be appreciated that, as an alternative to utilizing the forecasted load power requirement, the controller 116 may be configured to utilize the current load power requirement as the basis for determining the candidate engine speeds.”); EX1028, 122:6-21 (“In one teaching of Xing, it can use a current load power requirement.”). Petitioner thus falsely implies that Dr. Kemal testified that a forecasted P_{load} can be replaced by a current engine load, which is not the case. As explained above, even when a current load power requirement is used, the ultimate speed adjustments are based on that load power requirement rather than any engine load (P_{engine}) that may have been measured to determine the load power requirement.⁴ See POR, 15-17; *supra*, section II.A.2.

Accordingly, for these reasons, Petitioner fails to meet its burden in showing that Xing discloses adjusting an engine speed “based on the engine load.”

⁴ Moreover, as noted in the response, the fact that Xing follows the same method whether a current P_{load} or a forecasted P_{load} is used as the basis for determining and selecting from candidate engine parameters further illustrates that any measured P_{engine} has no impact on Xing’s speed adjustment. POR, 18.

B. Petitioner Fails to Show Xing Discloses Adjusting An Engine Speed Based on “Predefined Efficiency Points...Providing Optimum Engine Speeds for Different Engine Loads”

Caterpillar identified two issues with Petitioner’s reliance on Xing as allegedly disclosing adjusting an engine speed based on “predefined efficiency points...providing optimum engine speeds for different engine loads”: (1) to the extent Xing’s FIG. 11 (or any other similar fuel efficiency table) includes points that identify an optimum speed for a given torque value, they are not the points (*e.g.*, the candidate speed-torque pairings) that Xing uses as a basis for adjusting the engine speed; and (2) conversely, any points that do serve as a basis for adjusting the engine speed in Xing (*i.e.*, the candidate speed-torque pairings), those points do not “provide optimum engine speeds for different engine loads” because the candidate speed is not an “optimum engine speed[]” for the paired candidate torque. POR, 20-24.

In reply, Petitioner does not dispute the first issue. Reply, 16-18. Petitioner, however, disputes the second issue based on two arguments: (1) because the claims do not recite “most optimum,” then Xing’s candidate speeds can be viewed as an “optimum” speed for the paired torques; and (2) the candidate speed that Xing selects for its speed adjustment is an “optimum” speed because it is optimal relative to the other candidate speeds. *Id.* Both arguments are unavailing because they effectively read out the express language of the claims.

First, Petitioner argues that Caterpillar “imports limitations into the Claims” because the claims do not recite “any requirement that the engine speed be the most efficient engine speed or specify[] what the engine speed should be optimized for.” Reply, 16. Petitioner again mischaracterizes Caterpillar’s argument as dependent on reading limitations into the claims. The issue does not turn on whether the most efficient overall speed is selected. Rather, the claims are plain on their face: an engine speed of the engine is adjusted based on “predefined efficiency points” that, in addition to being based on fuel consumption rates, provide “*optimum* engine speeds *for* different engine loads.” Caterpillar showed that the candidate engine speeds in Xing are not disclosed to be the optimum speed for the particular torque they are paired with. POR, 21-22, 24; *cf. id.*, 5-6 (citing EX1001, 4:23-27, 5:7-12, FIG. 4). Instead, they are simply speed-torque combinations sufficient to achieve the load power requirement. *Id.* The distinction between this and the claimed invention is right in the claims: the claimed engine speeds provided via efficiency points are “optimum” and they are optimized “for different engine loads.”

While the claims do not require selecting the single most efficient engine speed for an engine, they do require that the claimed predefined efficiency points provide optimum engine speeds for different loads. Petitioner attempts to sidestep this plain language by reading the term “optimum” out of the claim. According to

Petitioner, the claimed optimum engine speeds extend to suboptimum speeds because the claims do not recite the “most optimum” speed. Reply, 17 (arguing Caterpillar’s expert interprets the claims to “require selecting the most optimum engine speed.”). Adding “most” to “optimum” is redundant. Petitioner’s argument allows Petitioner to map any engine speed associated with any engine load to the claim language, whether or not that speed is actually an optimum speed for that load. As Caterpillar explained, while it may be argued that a candidate engine speed is an engine speed for its paired torque, there is no evidence in Xing that the speed is an *optimum* speed for that torque, especially given that Xing’s method calculates the candidate engine speed *before* any candidate engine torque. POR, 22-24 (citing EX1006, 10:16-18, 12:28-33; EX2001, ¶59). Moreover, these parameters are calculated to achieve the load power requirement, not any engine load, making it unclear how the candidate engine speed can be an “optimum” speed for the paired torque.

Furthermore, for its second argument, Petitioner asserts that the speed-torque pair that Xing selects for its speed adjustment satisfies the claim language because it is the pair that maximizes fuel efficiency relative to the other speed-torque pairs. Reply, 17-18 (asserting Xing “states that the controller selects the engine speed/torque pair *that maximizes fuel efficiency*, and then clarifies which pair that would be—the one that intersects closest to the optimal fuel efficiency point 30”

(emphasis original)); *see also id.*, 18 (reproducing Dr. Stein’s declaration testimony stating the same). However, this argument again fails to address the language of the claims and again reads out claim terms. Petitioner does not explain how the simple fact that the speed-torque pair selected by Xing has the highest fuel efficiency relative to the other speed-torque pairs means that the speed of that selected pair is an optimum speed “for different engine loads” (or even the torque it is associated with). Furthermore, by Petitioner’s logic, the mere selection of a given speed-torque pair as more fuel efficient relative to the other pairs makes that selected speed an “optimum” speed for the engine load. Following that logic, if only one speed-torque were disclosed, it would always be the optimum speed for an engine load, regardless of the speed’s relationship with the load. Such reasoning renders the requirement that the efficiency points “provid[e] optimum engine speeds for different engine loads” meaningless.

Accordingly, for these reasons, Petitioner fails to meet its burden in showing that Xing discloses adjusting an engine speed “based on one or more predefined efficiency points...providing optimum engine speeds for different engine loads.”

C. Petitioner Fails to Meet Its Burden to Establish Unpatentability of Dependent Claim 13

Grounds 1 and 2 of the petition challenged the patentability of dependent claim 13, which requires “a clutch disposed between the engine and the rotor, the controller being configured to selectively disengage the rotor from the engine

through control of the clutch.” Pet., 73-76, 78-80. For Ground 1, the petition relied solely on Xing for this claim. POR, 24-25. For Ground 2, the petition alternatively turned to Laux as allegedly teaching the claimed limitations. *Id.*, 33-34. The response noted that neither Xing nor Laux taught the claimed clutch limitations and, with respect to the petition’s reliance on Laux, the petition had failed to show that a POSA would have been motivated to combine the references in a manner that would have satisfied the limitations of claim 13. *Id.*, 24-39.

In reply, Petitioner accuses Caterpillar of “ignoring [Petitioner]’s asserted proposed combination and misapplying the teachings of both references.” Reply, 18-19. However, as discussed below, Petitioner’s reply arguments misread the term “disengage” as it is recited in the claim, create highly-specific scenarios that fail to reach the claim limitations, and propose a modification that is neither taught nor suggested by the references themselves, whether alone or in combination. For these reasons, Petitioner fails to meet its burden in showing that the applied references render the limitations of dependent claim 13 unpatentable.

1. Petitioner fails to show Xing discloses a clutch that disengages the rotor from the engine

For Ground 1, Petitioner relies on two clutch arrangements in Xing, forward/reverse directional clutches 52, 54 and PTO clutch 114, as allegedly disclosing a clutch that disengages the rotor from the engine. *See* Reply, 18-23.

Petitioner's reply arguments remain insufficient to establish that either of these clutch arrangements "disengage the rotor from the engine."

a) Xing's directional clutches 52, 54

Petitioner argues that Xing's directional clutches 52, 54 map to the claimed "clutch" because Caterpillar "improperly interprets Claim 13 to require the clutch to disengage all power, not just the power flowing through the clutches, from the engine" and claim 6, from which claim 13 depends, "does not exclude the presence of other drivetrain elements such as Xing's pump 36 and motor 40 and Laux's electric motors...that can drive the rotor using power from [the] engine." Reply, 19. Petitioner then concludes that because Xing's directional clutches 52, 54 "disengage the power from the engine that flows through the transmission's mechanical branch," the clutches disclose the limitations of claim 13. *Id.*, 20-21.

Petitioner's arguments are unavailing because they rewrite the claim to require disengagement of the power flowing through the clutch, rather than disengagement of the rotor from the engine. Claim 13 does not recite that the claimed clutch disengages "power" flowing from the engine to the rotor through the clutch. Instead, the claim specifies that the clutch disengages one component (the rotor) from another component (the engine). Petitioner's argument that claim 13 includes the limitations of claim 6, which is broad enough to encompass other methods of powering the rotor after the clutch is disengaged (Reply, 19), ignores

the fact that claim 13 is a narrowing dependent claim. Claim 13 goes beyond a mere requirement that one flow of power from the engine to the rotor is cut off through disengagement of the clutch; it instead recites that specific components themselves are disengaged from one another: the rotor from the engine.

Petitioner's reading that claim 13 is satisfied where only "the power from the engine that flows through the transmission's mechanical branch" is disengaged (Reply, 20) reads out the limitation specifying the particular components, the rotor and the engine, that are disengaged from each other.

As the response noted, Xing's directional clutches 52, 54 fail to "disengage the rotor from the engine" because the rotor would remain engaged to the engine via the hydrostatic branch, as evidenced by its ability to still transmit power to the rotor. POR, 25-29. In reply, Petitioner devises scenarios in which power flow via the hydrostatic branch may not occur.⁵ See Reply, 20-21 (arguing that "the angle of the swash plate" adjusted "to provide zero speed" with Xing's parking brake 70 actuated meets the claimed limitations). However, as Petitioner acknowledges, Dr. Kemal testified that, even in view of Petitioner's hypothetical configuration in which the swash plate angle is at zero, power could still be transmitted from the

⁵ By Petitioner's logic, simply turning off the engine (thus eliminating power flow) would satisfy the claim.

engine to the rotor. *See* Reply, 21 n.4 (citing EX1028, 81:19-82:1). While Petitioner attempts to dismiss this testimony as “speculat[ive],” it was Petitioner who invited this testimony and Dr. Kemal, based on his knowledge and experience, gave his reasoned expert opinion. *See* EX1028, 81:2-18 (Dr. Kemal explaining familiarity with hydrostatic units with swashplates). Petitioner, who responds with no expert testimony of its own, cannot now ignore this unrebutted testimonial evidence simply because it did not like the answer.

For these reasons, Petitioner fails to show Xing’s directional clutches 52, 54 “disengage the rotor from the engine” as recited in claim 13.

b) Xing’s PTO clutch 114

As the response explained, Petitioner further failed to establish that its alternative reliance on Xing’s PTO clutch 114 discloses the claimed clutch that “disengage[s] the rotor from the engine.” POR, 31-33 (citing Pet., 75 n.4). In reply, Petitioner does not dispute Caterpillar’s observations regarding the deficiencies of the petition’s footnote analysis. Reply, 21-23. For instance, Petitioner does not dispute that the petition failed to address the language of the claim, failed to provide a proper obviousness analysis, and raised inconsistencies with respect to Petitioner’s mapping of Xing’s PTO to the challenged claims as a whole. *Id.*, 32. Furthermore, Petitioner does not even attempt to respond to Caterpillar’s observation that the evidence cited by Petitioner as illustrating Xing’s

PTO clutch 114 arrangement—Dr. Stein’s testimony that Laux taught the same clutch arrangement—directly contradicts any conclusion that Xing’s PTO clutch meets the claimed limitations because Laux’s clutch arrangement fails to “disengage” a load (*e.g.*, a milling drum from the engine). *Id.*, 32-33 (citing EX2001, ¶76 (“Laux teaches connecting a transmission in this manner.”)).

Instead, Petitioner’s reply focuses on establishing that “Xing discloses that controller 116 controls clutch 114.” Reply, 22-23. However, the deficiencies identified above, to which Petitioner has no response, are not negated by whether Xing’s controller 116 controls clutch 114. Indeed, the most salient point remains wholly unaddressed by Petitioner: according to Petitioner’s own expert, Laux illustrates a clutch arrangement that connects a transmission in the same manner as Xing’s PTO clutch 114. EX2001, ¶76. However, Laux’s clutch arrangement does not “disengage” the load (*i.e.*, rotor) from the engine as required by claim 13. POR, 32-33, 36-37. Therefore, applying Dr. Stein’s testimony, Xing’s PTO clutch 114, which connects the transmission as in Laux, also fails to “disengage” the load from the engine. Petitioner thus fails to show that Xing’s PTO clutch 114 “disengage[s] the rotor from the engine” as recited in the claim.

2. Petitioner’s reliance on Laux fails to cure the deficiencies of Xing

With respect to Petitioner’s alternative reliance on Laux, the response noted that Laux failed to cure the deficiencies of Xing because, like the clutches of Xing,

Laux's clutch 15 also fails to "disengage the rotor from the engine." POR, 36-37. Further, Petitioner's motivation to combine Willis, Xing, and Laux based on alleged "safety reasons" was unsupported by the applied references and, even if it were, a POSA would not have implemented the combination such that a controller would control the clutch to disengage the rotor from the engine for safety purposes. POR, 37-39. In reply, Petitioner contends that Caterpillar's arguments focus "on Laux as an independent reference rather than how it is used as part of the proposed combination." Reply, 23. Petitioner's reply arguments, however, are unavailing because they not only advance a modification that was not proposed in the petition, but they also combine the references in a manner that is not supported or suggested by the references, evidencing hindsight.

First, Petitioner argues that "[w]hen implemented in the proposed combination, Laux's shift clutch 15 would have been located as the last drive train element between Xing's transmission and adjacent Willis's drive pulley 'belt-and-pulley system' at the output of Xing's transmission." Reply, 23 (citing Pet., 11). However, as an initial matter, Petitioner's proposed modification is improper because it was not presented in the petition and instead is newly advanced in

reply.⁶ *See* Pet., 78-80 (relying on Laux’s unmodified clutch 15 that “could disengage engine 4 from belt drive 16, drive transmission 17, and rotor 7”); Consolidated Trial Practice Guide, 73 (Nov. 2019) (prohibiting “new evidence or argument in reply” that “could have [been] presented earlier, e.g. to make out a prima facie case of unpatentability”); *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369-70 (Fed. Cir. 2016) (affirming Board’s finding that petitioner’s argument relying on other features not taught by the ground reference raised first in reply was improper).

⁶ In addition, Petitioner’s new modification contradicts the combination as proposed in the petition. Specifically, Petitioner overlooks that the petition proposed **replacing** Willis’s belt-and-pulley system with the variable transmission of Xing. *See* Pet., 11 (arguing that “[i]n early machines, like that taught by Willis,” the rotor was driven “through a direct drive train,” which, in Willis, “include[s] components between the engine and cutter drum such as ‘**a belt-and-pulley system** or a gear train’” (emphasis added)), 36, 43 (arguing that “[i]n Willis, the rotor is coupled to **the output of the direct drive train**,” but “[t]he proposed modification **would couple Willis’s rotor to the output of Xing’s transmission**” (emphasis added)), 59-63. Petitioner’s newly asserted modification, which now relies on components of Willis’s direct drive train, is thus contrary to the petition.

Even so, Petitioner's new modification is insufficient to satisfy its burden in establishing obviousness because the clutch arrangement proposed by Petitioner is neither taught nor suggested by the applied references. Although Petitioner seeks to place Laux's clutch between the transmission and any output at the transmission, Laux's clutch is disposed between the engine 4 and transmission 17. *See* EX1012, FIG. 3; Pet., 78-79 (relying on clutch 15's placement between engine 4 and input of drive transmission 17). Further, Petitioner does not allege that Willis or Xing teach such a configuration. Other than alleged "safety reasons" (which, as explained below, are insufficient as well), Petitioner provides no evidence explaining why a POSA would have been motivated to reposition Laux's clutch in this manner. Petitioner's hindsight-based approach of placing Laux's clutch where it sees fit should thus be rejected.

Second, Petitioner's alleged motivation that a POSA would have implemented Laux's clutch "as a safety feature" for tool replacement remains insufficient. Petitioner argues that its motivation is justified because "the proposed combination only alleges implementing Laux's clutch 15." Reply, 25. However, by now singling out Laux's clutch to the exclusion of how that clutch is actually used in Laux, Petitioner essentially concedes that Laux does not teach using a clutch "as a safety feature for disengaging the milling drum from the engine when replacing milling drum tools" (*id.*), leaving Petitioner's cherry-picked use of

Laux's clutch for a different purpose bereft of any support in the ground references. POR, 38.

Moreover, as Dr. Kemal testified, even if a POSA would have used Laux's clutch 15 as a safety feature during tool replacement, a POSA would not have implemented such a combination in the manner claimed—*i.e.*, by using a controller to control the clutch because doing so would implicate the same safety issues that a POSA would have sought to avoid. POR, 38-39 (citing EX2001, ¶87). Petitioner does not even attempt to respond to this evidence. *See* Reply, 23-26. Thus, Dr. Kemal's testimony that, if used for the safety purpose proposed in the petition, a POSA would not have used a controller to control the clutch as required by the claim, is unchallenged and unrebutted.

For these reasons, Petitioner fails to show that the combination of Willis, Xing, and Laux renders the limitations of claim 13 unpatentable.

III. CONCLUSION

Accordingly, for at least the reasons set forth above and in Caterpillar's patent owner response, the petition fails to meet its burden of establishing the unpatentability of claims 1-13 of the '538 patent.

Respectfully submitted,

Date: November 15, 2023

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CERTIFICATE OF COMPLIANCE

Pursuant to §42.24(d), the undersigned certifies that this paper contains no more than 5,600 words, not including the portions of the paper exempted by §42.24(b). According to the word-processing system used to prepare this paper, the paper contains 5,382 words.

Respectfully submitted,

Date: November 15, 2023

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CERTIFICATE OF SERVICE

I certify that the foregoing Patent Owner's Sur-Reply was served on this
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