Paper No. _____
Filed: December 16, 2022

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 PRELIMINARY RESPONSE PURSUANT TO 37 C.F.R. § 42.107

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I. INTRODUCTION

The Board should not institute *inter partes* review of claims 1-13 of U.S. Patent No. 9,975,538 ("the '538 patent") because Petitioner Wirtgen America, Inc. fails to show that it has a reasonable likelihood of prevailing.

The petition challenges each of the independent claims of the '538 patent based on a single ground of obviousness in view of Willis and Xing. The petition, however, provides an incomplete analysis supporting its obviousness challenge and fails to address with particularity where each and every element of the claimed invention is found in the asserted prior art references. Instead, for many of the claimed limitations, the petition provides only broad descriptions of the prior art and conclusory assertions that the references disclose the required claim limitations without ever specifying which aspect of the prior art corresponds to a particular claim element and how those aspects disclose the control method as claimed.

For example, the claimed invention requires the determination of "an engine load of the engine." While conceding that one aspect of the prior art—Xing's "load power requirement"—does not constitute the claimed "engine load," the petition never goes on to identify what other aspect of the prior art should be interpreted as the claimed "engine load." What's more, the petition contends Xing's fuel efficiency algorithm reads on the claimed method, in particular, the claimed adjustment of "an engine speed of the engine" that is both based on the

determined engine load and "one or more predefined efficiency points" that provide "optimum engine speeds for different engine loads." But, yet again, in making its contentions, the petition simply summarizes Xing's disclosure and concludes that it meets the claimed method limitations without tying the method steps disclosed in Xing to the method steps as explicitly recited in the claims. In so doing, the petition overlooks significant differences between the method disclosed in Xing and the invention claimed in the '538 patent. The petition's shallow analysis of the claims and the prior art thus fails to make out a *prima facie* case of invalidity with the requisite particularity.

In addition, the petition presents a flawed analysis regarding a POSA's motivation to combine the asserted references by again overlooking the distinct teachings of the applied references. The relied upon Willis and Xing references teach different systems with different approaches to efficiency and different objectives for machine performance. The petition fails to address these distinctions that, when actually considered, fail to provide a motivation to combine the references' teachings in the manner proposed in the petition.

Accordingly, institution of *inter partes* review should be *denied*.

II. CLAIM CONSTRUCTION

A claim subject to *inter partes* review receives its plain and ordinary meaning, interpreted in light of the specification of the patent in which it appears.

See 37 C.F.R. § 42.100(b). The terms of the challenged claims do not require express construction in order to reach a decision denying institution.

III. GROUND 1 FAILS

The petition fails to establish a reasonable likelihood of prevailing on Ground 1 because it fails to show that Willis and Xing describe each and every limitation recited in the claims and fails to establish that a POSA would have been motivated to combine Willis and Xing as proposed by the petition.

A. Independent Claim 1

1. The petition fails to establish Willis and Xing disclose "determining an engine load" (Element 1[b])[1]

Claim 1 recites a controller-implemented method of controlling a machine having a rotor coupled to an engine through a variable transmission that includes "determining an engine load of the engine." The petition asserts that "Willis's milling machine, modified to include Xing's algorithm and CVT, would have resulted in a controller that determined an engine load of the engine because Xing's algorithm was already configured to 'determine an engine load' during operation." Pet., 44. Apart from this broad assertion, however, the petition fails to

[1] For ease of reference, the petition's numbering of claim elements is used.

identify and explain what part of Xing's process constitutes "determining an engine load of the engine." *See id.*, 44-47.

Specifically, the petition alleges "Xing taught a conventional controller that stores algorithms for performing a method of optimizing fuel efficiency," pointing to Figure 4 of Xing. *Id.*, 44. Figure 4 of Xing does not show a step where an "engine load" of the engine is determined by the controller, nor does the petition point to any step of the method illustrated in the figure as constituting such a determination. *See id.*, 44-45.

Instead, the petition goes on to assert that Xing's "controller received signals from sensors communicatively coupled to the controller, such as torque sensor 122 and engine speed 124." *Id.*, 45. The petition then alleges that, "[b]ased on those signals, the controller in Xing evaluated power losses . . . at different candidate operating speeds, measured engine load to determine the work output demanded of the machine, and independently set engine speeds and transmission ratios to minimize fuel consumption while achieving desired performance." *Id.*, 46. While the petition cites to Xing as allegedly supporting this assertion, the portions of Xing on which the petition relies only refer to the method shown in Figure 4. *See* EX1006, 8:67-9:3, 9:9-17. The petition again does not specify which step in Xing's method shown Figure 4 results in the controller "determining an engine load."

Addressing the method shown in Xing's Figure 4, the petition refers to block 202, in which the petition alleges Xing's "processor calculated a current load power requirement (P_{load})—the amount of power for the machine to accomplish work—by measuring the current engine power (P_{engine}) and estimating current power loss (P_{loss})." Pet., 46; *see also* EX1006, FIG. 4 (showing step 202 as "determine the load power requirement for the work vehicle"). Yet again, the petition does not explain which (if any) of these three variables equates to the claimed "engine load," let alone what specific aspect of Xing is purported to describe "determining" such an engine load. *See* Pet., 46-47.

At the very least, the petition admits that the "load power requirement (P_{load})" of Xing does not constitute the claimed "determining an engine load of the engine." Pet., 47. In fact, Petitioner distinguishes between the claimed engine load and Xing's P_{load}, arguing that Xing first determines the engine load in order to subsequently calculate P_{load}. *Id.*, 47 ("As explained for limitation 1[b], Xing's algorithm determined the current engine load to calculate the machine's power load requirement.")

If Petitioner intended to map either Xing's "engine power (P_{engine})" or "power loss (P_{loss})" to the claimed "engine load of the engine," no such identification can be found in the petition. Nor does the petition provide any assertion or explanation as to how the calculation of either Xing's P_{engine} or P_{loss}

might be understood as "determining an engine load of the engine." Moreover, as explained in more detail below, even assuming that Xing's "engine power (P_{engine})" or "power loss (P_{loss})" are somehow a determination of "an engine load of the engine," Xing's control method would still fail to meet the requirements of the claim because the method does not "adjust[] an engine speed based on" the current engine power or current engine loss. *See infra*, section III.A.2.a.

For this reason, the petition fails to establish that Willis and Xing disclose a controller-implemented method that "determin[es] an engine load of the engine" as recited in claim 1.

2. The petition fails to establish Willis and Xing disclose "adjusting an engine speed of the engine based on the engine load and one or more predefined efficiency points at least partially based on predetermined fuel consumption rates and providing optimum engine speeds for different engine loads" (Element 1[c])

Claim 1 further recites that the controller-implemented method includes "adjusting an engine speed of the engine based on the engine load and one or more predefined efficiency points at least partially based on predetermined fuel consumption rates and providing optimum engine speeds for different engine loads." In other words, claim 1 requires "adjusting an engine speed" based on (1) the determined "engine load" of the engine; and (2) one or more "predefined efficiency points" (a) at least partially based on "predetermined fuel consumption

rates" and (b) "providing optimum engine speeds for different engine loads." EX1001, claim 1; *see also id.*, claim 6 (claiming a controller configured to "adjust an engine speed based on the engine load and one or more predefined efficiency points being based at least partially on predetermined fuel consumption rates and providing optimum engine speeds for different engine loads").

The petition does not allege Willis discloses adjusting an engine speed as claimed in claim 1. *See* Pet., 47-49. Instead, it relies solely on Xing as allegedly disclosing the limitations and, in particular, on the method shown in Figure 4 of Xing. *See id.* As explained below, the petition fails to establish that the method of Xing discloses "adjusting an engine speed" that is (1) based on "the engine load" and (2) based on "one or more predefined efficiency points" that "provid[e] optimum engine speeds for different engine loads."

a. The petition fails to establish Willis and Xing disclose "adjusting an engine speed based on the engine load"

The petition generally alleges that "[t]he Xing controller-implemented method adjusted the engine to run at a speed that minimizes fuel consumption based on the current load on the engine." Pet., 47. The petition's contentions fail for several reasons. First, the petition's deficiencies with respect to the claimed "determining an engine load" similarly fail to show that Xing discloses "adjusting an engine speed based on the engine load." Second, the petition only identifies the

"load power requirement," a variable the petition concedes does not constitute the claimed "engine load," as a basis for adjusting an engine speed. Third, to the extent the petition conclusory alleges that a "current engine load" underlies the calculation of the "load power requirement" of Xing, Xing's control method still fails to disclose that the adjustment of engine speed is based on the "current engine load" because such adjustment is based on ***candidate*** engine powers.

i. The petition fails to identify the claimed "engine load"

First, the petition fails to establish that Xing discloses a method in which an engine speed is adjusted based on "the engine load" because, as explained above, the petition fails to specifically identify what in Xing's method constitutes the claimed determination of the "engine load." *See supra*, section III.A.1. Thus, for this reason alone, the petition fails to establish that Xing discloses "adjusting an engine speed based on the [determined] engine load."

ii. The petition relies on Xing's determination of a "load power requirement"

Second, the petition, at best, asserts only that Xing's method determines a target engine speed based on the ***load power requirement*** for the work vehicle. *See* Pet., 47. More specifically, the petition relies on Figure 4 of Xing (reproduced below), which shows a method that begins with step 202 of "determin[ing] [a] load power requirement for the work vehicle." EX1006, FIG. 4; *see also* Pet., 47-48.

The petition then asserts that "in blocks 204 to 208 of Figure 4, controller 116 calculated a plurality of candidate engine settings (i.e., pairs of specific engine speeds and engine torques) ***based on the power load requirements*** and the estimated power loss due to the machine's components." Pet., 47 (emphasis added).

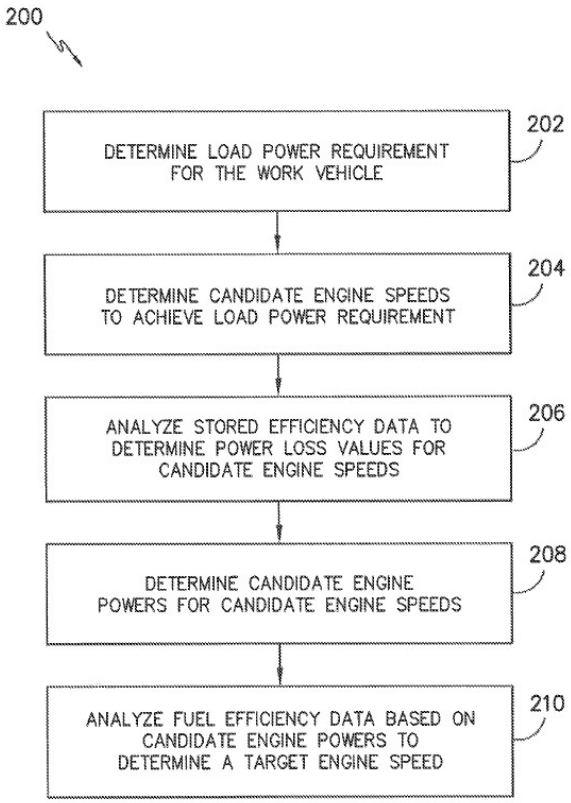

FIG. —4—

From this, the petition goes on to state that, "[i]n block 210 of Figure 4, controller 16 determined which engine settings may be used for minimizing fuel consumption" and then "adjusted the engine to operate at the target engine speed."

Id., 48-49. Thus, at best, the petition only asserts that Xing discloses adjusting the engine to operate at a target engine speed that is based on the load power requirement. As noted above in section III.A.1, however, Xing's "load power requirement" cannot be the claimed "engine load" because the petition distinguishes the two. *See id.*, 47.

Moreover, while the petition contends that "Xing's algorithm determined the current engine load" (without identifying what aspect of Xing that is, *supra*, section III.A.1) "to calculate the machine's power load requirement," this still fails to establish that Xing adjusts an engine speed based "based on the engine load" as claimed. First, the petition does not allege that Xing's method adjusts an engine speed ***based on*** the "current engine load," even in an indirect manner. Pet., 47. Nor does Xing disclose that the engine speed is adjusted based on any alleged "current engine load." As explained further below, Xing discloses that its method for determining a target engine speed is not "based on" any alleged "current engine load" (or even "load power requirement"), but rather ***candidate engine powers***. *Infra*, section III.A.iii.

iii. Xing does not disclose adjusting an engine speed based on any alleged current "engine load"

As noted above, the petition asserts that Xing discloses measuring a "current engine power (P_{engine})" and "current power loss (P_{loss})" to calculate a "current load

power requirement (P_{load})." Pet., 46. Even assuming, *arguendo*, that the current engine power (P_{engine}) or current power loss (P_{loss}) correspond to the claimed "engine load," neither of these variables are used to "adjust[] the engine speed" in Xing's method.

Specifically, in Xing's method, the controller is "configured to receive a speed command signal from the operator corresponding to a desired ground speed for the work vehicle 10," and the method initiates "once the desired ground speed has been achieved." EX1006, 9:4-17. Once initiated, the method first determines "a load power requirement for the work vehicle 10" (step 202 in FIG. 4), which "may be determined indirectly by calculating the current engine power (P_{engine}) and the current power loss (P_{loss}) of the work vehicle 10." *Id.*, 9:18-24. 9:37-40.

In step 204, the method next determines "a plurality of candidate engine speeds . . . based on the load power requirement," *i.e.*, the method identifies particular engine speeds that "may be utilized to achieve the vehicle's load requirement." *Id.*, 10:16-25; *see also id.*, 10:34-38, FIG. 5. Using these candidate engine speeds, the method then determines potential power loss values and candidate engine powers for each of the candidate speeds (steps 206 and 208). *Id.*, 10:43-45, 11:65-67; *see also id.*, 11:15-47, 11:67-12:11, FIGS. 6-10 (showing power consumption efficiency data for various vehicle components).

Finally, the method analyzes "fuel efficiency data . . . to determine a target engine speed for the work vehicle 10 ***based on the candidate engine powers***" (step 210). *Id.*, 12:26-28 (emphasis added). Xing discloses that this last step involves calculating "a candidate engine torque . . . for each pair of candidate engine powers and speeds (e.g., by dividing each candidate engine power by its associated engine speed)." *Id.*, 12:28-33. Xing's method then compares "[e]ach set of engine torques and engine speeds" to a "fuel consumption map for an engine," which has "an optimal efficiency point 300 at which the fuel efficiency of the engine is maximized." *Id.*, 12:33-44. Xing discloses that the controller "adjust[s] the engine settings" to the pair of engine torque and engine speed that intersects closest to the optimal efficiency point 300. *Id.*, 12:44-63.

Thus, Xing's method does not "adjust[] an engine speed" based on the current engine power (P_{engine}) or current power loss (P_{loss}) that were used to calculate the load power requirement. Instead, Xing discloses a method that first identifies a plurality of candidate engine speeds that are then used to identify ***candidate engine powers***. Xing further discloses that it is these pairs of candidate engine speeds and engine powers that are used to adjust the engine settings (i.e., engine torque and engine speed) for fuel efficiency purposes. In other words, Xing's method "adjust[s] an engine speed" not based on the current engine power

and current power loss, but rather based on a set of candidate (i.e., ***potential***) engine powers.

Xing confirms that its method for adjusting the engine settings for fuel efficiency purposes is not based on either the current engine power (P_{engine}) or current power loss (P_{loss}). Specifically, Xing acknowledges that "the various drive train components and other power consuming components of the work vehicle 10 may generally operate at different efficiencies, with each component consuming varying amounts of power at differing vehicle operating parameters." EX1006, 7:4-8. As a result, "the most efficient operating conditions for one component may result in decreased efficiency for one or more other vehicle components." *Id.*, 7:8-11. For example, "the efficiency of the transmission 24 may be relatively low when the engine settings (i.e., engine speed and engine torque) are selected to provide the most fuel efficient engine operation." *Id.*, 7:11-14. As such, Xing discloses its method "may be utilized to enhance fuel efficiency . . . by taking into account the individual component efficiencies of the various power consuming components of the work vehicle 10." *Id.*, 7:14-21.

In other words, the ***current*** engine power or ***current*** power loss will not inform the target engine speed determined by Xing's method for fuel efficiency because, as Xing discloses, components of the system will "operate at different efficiencies" at "differing operating parameters." *Id.*, 7:4-8. Hence, Xing's

method, after calculating the load power requirement, relies on the identification of ***candidate*** engine parameters (i.e., "differing operating parameters"), which inform the total power loss of the power-consuming components of the work vehicle associated with each of the various operating parameters and, after taking all components into account, inform the method for identifying which candidate parameters provide improved fuel efficiency. *See id.*, 7:14-21, 10:42-11:47, 12:12-63, FIGS. 6-10.

Accordingly, the petition fails to establish Willis and Xing disclose "adjusting an engine speed based on the [determined] engine load."

b. The petition fails to establish Willis and Xing disclose "adjusting an engine speed" based on "one or more predefined efficiency points" that "provid[e] optimum engine speeds for different engine loads"

The petition also fails to establish that Xing's method "adjust[s] an engine speed" based on one or more "predefined efficiency points" that "provid[e] optimum engine speeds for different engine loads." First, the petition again presents a deficient analysis that fails to particularly address the limitations of the claims and explain what aspects of Xing's method constitute a "predefined efficiency point" as claimed. Further, when considering Xing's disclosure in view of the express language of the claim, the distinct control process of Xing fails to

disclose "adjusting an engine speed" based on "one or more predefined efficiency points" that "provid[e] optimum engine speeds for different engine loads."

i. The petition provides no analysis as to what aspect of Xing constitutes a "predefined efficiency point" as claimed

The petition generally alleges, in an introductory paragraph, that the proposed combination of Willis and Xing would have resulted in a controller that "would have implemented the step of adjusting an engine speed of the engine based on the engine load and engine maps that provide optimum engine speeds for different engine loads." Pet., 47. The petition then provides a brief description of Xing's control method, asserting that, after calculating "a plurality of candidate engine settings . . . based on the power load requirements and the estimated power loss," the controller determines "which engine settings may be used for minimizing fuel consumption based on a fuel consumption map[] (such as the one shown in Figure 11) or other suitable fuel efficiency data (such as that shown in Figure 5 above)" and adjusts "the engine to operate at the target engine speed." *Id.*, 48-50. In its concluding paragraph, the petition simply alleges that a POSA "would have incorporated Xing's engine map data and fuel efficiency data to determine an optimal engine speed for minimizing fuel consumption," with a reasonable expectation of success. *Id.*

Lacking throughout this short analysis, however, is any attempt to address the express limitations recited in the claim element and expressly map those limitations to particular aspects of Xing's disclosed method. For example, at no point of its description of Xing does the petition particularly identify any "predefined efficiency point" allegedly disclosed by Xing's "engine map data and fuel efficiency data." *See id.*, 47-49. Nor does the petition explain how that engine map data and fuel efficiency data "provid[es] optimum engine speeds for different engine loads." *See id.* Instead, the petition appears to presume that simply because Xing's method involves a fuel efficiency analysis, it must meet the limitations of the claims. However, such an analysis that fails to meaningfully confront the express language of the claims is insufficient to support Petitioner's burden in establishing the obviousness of the claims.

ii. Xing does not disclose "one or more predefined efficiency points" that "provid[e] optimum engine speeds for different engine loads"

Notwithstanding the petition's deficient analysis, Xing fails to disclose "one or more predefined efficiency points" that "provid[e] optimum engine speeds for different engine loads." As explained above, Xing's method first determines a "load power requirement" for the work vehicle, which is then used to identify a "plurality of candidate engine speeds" that may be used "to achieve the vehicle's load requirement." *See* EX1006, 9:18-24, 10:16-25, FIG. 4. Power loss values and

candidate engine powers are then identified for each candidate engine speed. *Id.*, 10:43-45, 11:65-67. Xing discloses that, for each pair of candidate engine speed and power, a candidate engine torque is determined. *Id.*, 12:26-33. Each set of candidate engine speed and candidate engine torque is then compared to fuel consumption data to identify the pair of engine speed and engine torque "at which the fuel efficiency of the engine speed is maximized." *Id.*, 12:33-63. Xing discloses that this can be achieved by identifying the pair of engine torque and engine speed that intersects closest to an optimal efficiency point 300 on a fuel consumption map, or the pair that is associated with a minimum bsfc value. *Id.*, 12:42-47, 12:64-13:7.

In view of the above, to the extent Xing discloses any "predefined efficiency point," the petition fails to establish that any "point" disclosed in Xing "provid[es] optimum engine speeds for different engine loads." Specifically, Xing only discloses a method in which an efficiency point 300 or bsfc value is used as a correlation from which to select a pair of an engine speed and an engine torque among a set of already-identified pairs of engine speeds and engine torques. Petitioner does not explain how Xing's method, which involves determining multiple candidate speeds (FIG. 4, step 204), then determining power loss associated with each candidate speed (FIG. 4, step 206), followed by determining candidate engine powers for each candidate engine speed (FIG. 4, step 208), and

then analyzing fuel efficiency data based on the candidate powers to select one of the candidate speeds (FIG. 4, step 210) satisfies the claim. EX1006, FIG. 4. In Xing's method, each candidate engine power is paired with a single candidate speed (*see, e.g., id.,* FIG. 5), and the speed (and corresponding power loss) determines the power. Petitioner provides no explanation how this maps to the claimed "providing optimum engine speeds for different engine loads."

Accordingly, the petition fails to establish that Willis and Xing disclose a controller-implemented method that "adjust[s] an engine speed of the engine based on . . . one or more predefined efficiency points at least partially based on . . . providing optimum engine speeds for different engine loads," as recited in claim 1.

3. The petition fails to establish that a POSA would have been motivated to combine Willis and Xing

The petition generally alleges that a POSA would have been motivated to combine the teachings of Willis and Xing "to minimize fuel consumption." Pet., 33. More specifically, the petition proposes incorporating Xing's continuously variable transmission and Xing's control method "to further improve fuel efficiency without impacting machine performance" in the machine of Willis. *Id.*, 34-35; *see also id.*, 39 ("A POSITA would have been motivated to modify Willis to include a variable transmission and control system like that taught by Xing . . . ."). The petition, however, misapprehends the purpose of Willis's system

and, in doing so, proposes a combination with Xing's variable transmission and control method that would be incompatible with Willis's principle of operation. The petition also fails to provide a sufficient rationale to further modify Xing's control method, which seeks to provide a fuel-efficient method to maintain a desired ground speed, to the drum speed of Willis's machine. As a result, the petition's rationale to combine the teachings of Willis and Xing is insufficient to support a case of obviousness.

a. The petition misapprehends the purpose of Willis's system

First, the petition fails to sufficiently account for the express purpose of Willis's system that is distinct from the control method disclosed in Xing. Specifically, Willis discloses a milling machine that includes a control system with a "load control feature." *See* EX1005, [0024]-[0025], [0028]. As shown below, a control receives a "desired speed DS_D" as selected by an operator of the milling machine. *Id.*, [0017]-[0018]. The control system is further "configured to sense the actual drum speed DS" and "adjust a speed of the engine . . . so that the sensed drum speed DS_S is generally equal to the desired drum speed DS_D." *Id.*, [0021]-[0022].

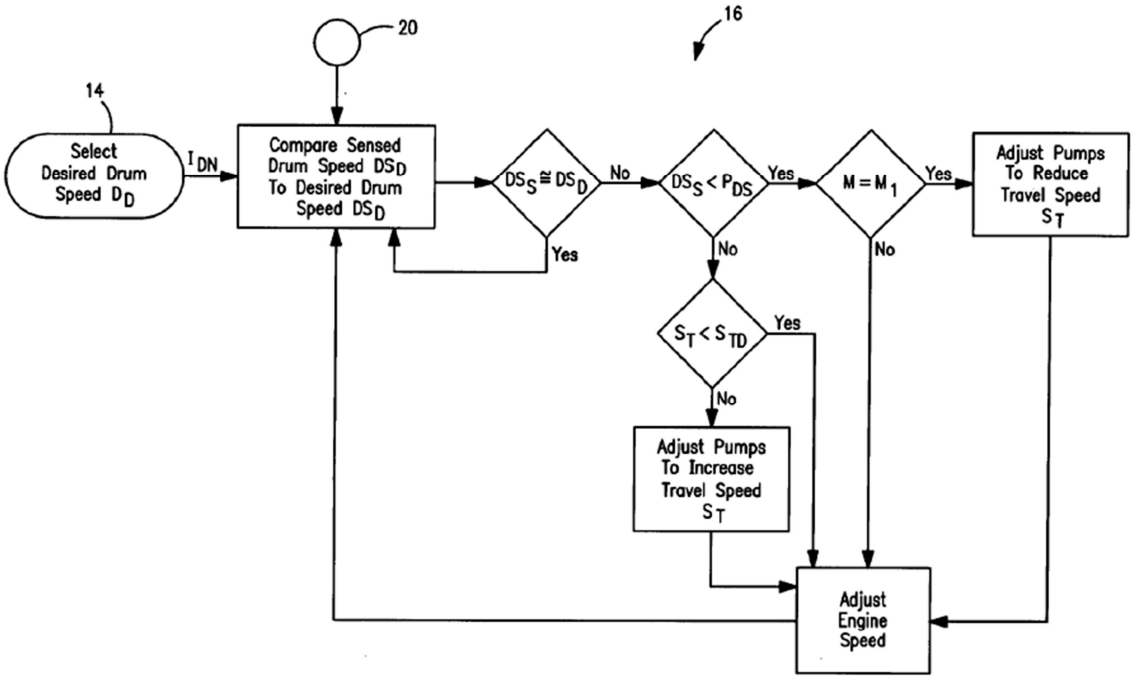

FIG. 9

EX1005, FIG. 9.

The control system is also configured to control the load exerted on the rotating drum. *See id.*, [0024]-[0025]. In this regard, the control system is "configured to compare the sensed drum speed DS_S with the desired speed DS_D" and "adjust the pumps 6 to reduce the speed of the crawler motors 8 when the sensed drum speed DS_S has a value lesser than a predetermined portion P_{DS} of the desired speed DS_D." *Id.*, [0024]. As such, the control system "causes the milling machine travel speed S_T to be reduced whenever the cutting drum 3 is rotating at less than a desired speed DS_D, which generally indicates that the load on the drum

3 is greater than desired (e.g., drum 3 begins cutting relatively harder material)." *Id.* Further, Willis discloses that the control system "is also configured to adjust the pumps 6 so as to increase the speed of the crawler motors 8 when the value of the sensed drum speed DS_S increases from less than or about the predetermined portion P_{DS} of the desired speed to either greater than the desired speed predetermined portion P_{DS} or to about the desired speed DS_D." *Id.*, [0025]. Thus, Willis discloses a control system that "provides a 'load control' feature that decreases the machine travel speed S_T whenever the load on the drum 3 is sufficiently increased so as to lower the drum speed DS substantially below a desired speed, and return the travel speed S_T to a desired value when the drum load is reduced." *Id.* In other words, Willis's control system does not seek to ***maintain*** the desired drum speed during operation of the milling machine, but rather ***monitors*** the sensed drum speed relative to the desired drum speed for load-control purposes.

The petition proposes combining the teachings of Willis and Xing so as to incorporate Xing's control method to "maintain[] desired rotor speed during operation" (Pet., 33-35), but fails to address, much less even acknowledge, this load-control feature of Willis's system, and how this feature comports with Xing's control method that seeks to maintain a desired selected speed.

Specifically, Xing's method is initiated after "the desired ground speed has been achieved," which, in the combination proposed, would correspond to the desired rotor speed in Willis's system. *See* EX1006, 9:4-9; Pet., 43 (arguing a POSITA would "modify Xing's algorithm to utilize the desired drum speed DS_D (corresponding [to] a desired rotor speed) input (I_{DS}) received by Willis's controller from Willis's speed selector rather than the desired ground speed that Xing teaches"). As the petition acknowledges, Xing's control method operates "to enhance the vehicle's fuel efficiency while ensuring that the vehicle 10 is maintained at the desired ground speed." *See* EX1006, 9:15-17; Pet., 50. Therefore, when incorporated into Willis's system, Xing's control method would result in Willis's system in ***maintaining*** the desired rotor speed, which, in turn, would ***maintain*** any resulting load on the drum, regardless if that load is higher than desired. Such a method would frustrate Willis's goal of controlling the load on the drum by monitoring sensed drum speed relative to the desired drum speed and correspondingly reducing machine travel speed based on the sensed drum speed regardless of the desired drum speed selected by the operator. Accordingly, the petition's rationale, which fails to address this feature of Willis and its compatibility with Xing's control system, is insufficient.

b. The petition fails to provide a further motivation to modify

Further rendering the petition's rationale insufficient is its reliance on an additional modification to the control method of Xing that is neither taught nor suggested by either of the applied references. The petition proposes "modify[ing] Xing's algorithm to utilize the desired drum speed DS_D (corresponding [to] a desired rotor speed) input (I_{DS}) received by Willis's controller from Willis's speed selector rather than the desired ground speed that Xing teaches." Pet., 43. Aside from this conclusory statement, however, the petition fails to provide any motivation as to why a POSA would have adapted Xing's control method away from utilizing desired ground speed to utilizing desired drum speed. The petition likewise fails to identify any evidence that would suggest a POSA would have deviated from the method Xing actually taught and instead utilized a desired drum speed.

Specifically, Xing discloses a work vehicle 10 having an engine that not only drives the wheels of the work vehicle, but also is configured to drive other power-consuming components of the vehicle. *See, e.g.*, EX1006, 4:33-37 ("[T]he work vehicle 10 may also be configured to be operably coupled to any suitable type of work implement . . . ."), 6:64-67 ("[T]he system 100 may also include a power take-off (PTO) 110 configured to transfer power from the engine 22 to one

or more implements via a PTO shaft 112."). As noted above, Xing's method takes into account the power losses associated with these power-consuming components when determining the appropriate engine settings to maintain the desired ground speed for fuel efficiency purposes. *See, e.g.*, *id.*, 3:48-67, 7:4-21, 9:15-17, 11:1-14, FIG. 4.

Willis also discloses a system having an engine that connects to both the wheels of a milling machine and a power-consuming work implement, *i.e.*, a drum. *See* EX1005, [0022]-[0023], FIG. 4 (showing engine 4 connected to both drum 3 and pumps 6 for driving crawler assemblies 7). Willis further describes driving the machine to achieve a desired travel speed S_T. *See id.*, [0026] (describing travel speed input device 22 to generate a travel speed input I_{TS}). Thus, even accepting Petitioner's contentions that a POSA would have been motivated to implement Xing's control method in Willis's machine, the petition provides no explanation why a POSA would have been further motivated to deviate from the teachings of Xing when implementing its control method in Willis's machine—*i.e.*, utilizing a desired ground speed for the work vehicle while still accounting for the power losses associated with the work implement of Willis's machine (*i.e.*, the drum). Aside from its hindsight-based conclusory statement, the petition fails to provide any additional reason to modify Xing's method to utilize a desired drum speed instead.

Accordingly, the petition's rationale for combining the references as proposed is insufficient for this additional reason.

B. Independent Claim 6

The petition largely relies on its arguments advanced for claim 1 with respect to independent claim 6. Pet., 59-66. Accordingly, for the reasons explained above with respect to claim 1, the petition fails to establish that Willis and Xing render claim 6 obvious.

C. Dependent Claims 2-5 and 7-13

Claims 2-5 depend from claim 1 and claims 7-13 depend from claim 1. Thus, for the same reasons explained above, the petition fails to establish that Willis and Xing render these claims obvious.

IV. GROUND 2 FAILS

Ground 2 of the petition asserts claims 8 and 13 would have been obvious over Willis, Xing, and Laux. Pet., 76-80. Claims 8 and 13 both depend from claim 6. The petition relies on Laux as allegedly teaching the use of planetary gears and a clutch, as claimed in claims 8 and 13. *Id.* The petition's reliance on Laux fails to cure the deficiencies of Willis and Xing identified above with respect to claims 1 and 6, and thus Ground 2 fails for the same reasons explained for Ground 1.

V. CONCLUSION

Accordingly, for at least the reasons set forth above, institution of *inter partes* review should be *denied*.

Respectfully submitted,

Dated: December 16, 2022

/Matthew A. Argenti/
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CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that this paper contains no more than 14,000 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 5404 words.

Respectfully submitted,

Dated: December 16, 2022

/Matthew A. Argenti/
Matthew A. Argenti, Lead Counsel
Reg. No. 61,836

CERTIFICATE OF SERVICE

I certify that the foregoing Patent Owner's Preliminary Response Pursuant to 37 C.F.R. § 42.107 was served this 16th day of December 2022, on the Petitioner at the electronic service addresses of the Petitioner at the following electronic service addresses:

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Respectfully submitted,

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