

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VOLKSWAGEN GROUP OF AMERICA, INC.
Petitioner

v.

MICHIGAN MOTOR TECHNOLOGIES LLC
Patent Owner

Case IPR2020-00446
Patent 6,763,804

**PETITIONER VOLKSWAGEN GROUP OF AMERICA, INC.'S
REPLY TO THE INSTITUTION DECISION**

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Patent Trial and Appeal Board
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PETITIONER’S UPDATED EXHIBIT LIST

Exhibit No.	Description
1001	U.S. Patent No. 6,763,804 to Pursifull (“’804 patent”)
1002	Prosecution File History of U.S. Patent No. 6,763,804 B2 (“’804 history”)
1003	Declaration of Gerald Micklow, Ph.D. (“Micklow Decl.”)
1004	<i>Curriculum Vitae</i> (CV) of Gerald Micklow, Ph.D. (“Micklow CV”)
1005	U.S. Patent No. 4,850,319 to Imoehl, titled “Electronic Throttle Actuator,” issued July 25, 1989 (“Imoehl”)
1006	U.S. Patent No. 4,656,407 to Burney, titled “Electric Motor Servo Control System and Method,” issued April 7, 1987 (“Burney”)
1007	U.S. Patent No. 6,329,777 to Itabashi et al., titled “Motor Drive Control Apparatus and Method Having Motor Current Limit Function Upon Motor Lock,” filed Sept. 7, 1999 (“Itabashi”)
1008	U.S. Patent No. 6,073,610 A to Matsumoto et al., titled “Control Apparatus of Internal Combustion Engine Equipped with Electronic Throttle Control Device,” issued June 13, 2000 (“Matsumoto”)
1009	European Patent Pub. No. 0121938 B1 to Murakami, titled “Throttle Control System for Automotive Vehicle,” published Dec. 30, 1986 (“Murakami”)

Exhibit No.	Description
1010	European Patent Application No. EP 0874148 A2 to Matsumoto et al., titled “Control Apparatus for a Vehicle,” published Oct. 28, 1998 (“Matsumoto II”)
1011	UK Patent Application No. GB 2339850 to Pursifull, titled “A Throttle Valve for an Internal Combustion Engine with a Limp Home Position,” published Feb. 9, 2000 (“Pursifull”)
1012	U.S. Patent No. 4,313,408 to Collonia, titled “Device for the Control of the Traveling Speed of a Motor Vehicle,” issued Feb. 2, 1982 (“Collonia”)
1013	U.S. Patent No. 5,078,110 A to Rodefled, titled “Method and Arrangement for Detecting and Loosening Jammed Actuators,” issued January 7, 1992 (“Rodefled”)
1014	U.S. Patent No. 4,854,283 to Kiyono et al., titled “Throttle Valve Control Apparatus,” issued Aug. 8, 1989 (“Kiyono”)
1015	U.S. Patent No. 6,286,481 to Bos et al., titled “Electronic Throttle Return Mechanism with a Two Spring and One Lever Default Mechanism,” issued Sept. 11, 2001 (“Bos”)
1016	U.S. Patent No. 4,771,850 to Matsuda, titled “Automotive Traction Control System with Feature of Enabling and Disabling Control Depending Upon Vehicle Speed,” issued September 20, 1988 (“Matsuda”)
1017	U.S. Patent No. 5,712,550 to Boll et al., titled “Apparatus for Controlling a Power Control Element of a Drive Unit of a Motor Vehicle,” issued Jan. 27, 1998 (“Boll”)

Exhibit No.	Description
1018	U.S. Patent No. 5,749,343 to Nichols et al., titled “Adaptive Electronic Throttle Control,” issued May 12, 1998 (“Nichols”)
1019	William M. Erickson, Protecting Servomotors from Self Destruction, Machine Design (Sept. 1, 2000) (“Erickson”)
1020	U.S. Patent No. 4,982,710 to Ohta et al., titled “Electronic Throttle Valve Opening Control Method and System Therefor,” issued Jan. 8, 1991 (“Ohta”)
1021	Snap-On, BMW Reference Manual (Aug. 2001, 1st ed.) (“BMW Manual”)
1022	William L. Husselbee, Automotive Computer Control Systems, Harcourt Brace (1989) (“Husselbee”)
1023	Snap-On, General Motors Reference Manual (Apr. 1995, 7th ed.) (“GM Manual”)
1024	Chrysler Front Wheel Drive 1981-92 Repair Manual (1992) (“Chrysler Manual”)
1025	Declaration of Sylvia D. Hall-Ellis, Ph.D. (“Hall-Ellis Decl.”)
1026	<i>Curriculum Vitae</i> (CV) of Sylvia D. Hall-Ellis, Ph.D. (“Hall-Ellis CV”)
1027	U.S. Patent No. 4,645,992 to Ritenour, titled “Electronically Controlled Servomotor Limit Stop,” issued Feb. 24, 1987 (“Ritenour”)

Exhibit No.	Description
1028	U.S. Patent No. 4,364,111 to Jocz, titled “Electronically Controlled Valve Actuator,” issued Dec. 14, 1982 (“Jocz”)
1029	Amended Complaint for Patent Infringement, <i>Michigan Motor Technologies LLC v. Volkswagen AG</i> , Case No. 2:19-cv-10485 (E.D. Mich.), filed April 30, 2019
1030	Second Amended Complaint for Patent Infringement, <i>Michigan Motor Technologies LLC v. Volkswagen AG</i> , Case No. 2:19-cv-10485 (E.D. Mich.), filed January 6, 2020
1031	Milestones on the Automotive Information Super-Highway, Snap-on Diagnostics (Apr. 13, 2001), <i>available at</i> https://web.archive.org/web/20010413220224/http://www.snapondia.com/mileston.htm
1032	MT2500 Scanner Home, Snap-on Diagnostics (June 11, 2001), <i>available at</i> https://web.archive.org/web/20010611023000/http://www.snapondia.com:80/scanner.htm
1033	Domestic Combo Primary Cartridge, Snap-on Diagnostics (April 11, 2001), <i>available at</i> https://web.archive.org/web/20010411032033/http://www.snapondia.com/99combo.htm
1034	Declaration of Gerald Micklow, Ph.D. in support of Petitioner’s Reply and Petitioner’s Opposition to Patent Owner’s Motion to Amend (“Micklow Second Decl.”)

I. INTRODUCTION

In the Institution Decision, the Board found that Petitioner Volkswagen Group of America, Inc. (“VW”) presented a reasonable likelihood of proving *all* claims of the ’804 patent unpatentable. The Board made this finding for *both sets of grounds*—the Itabashi grounds and the Matsumoto grounds. Rather than producing arguments or evidence to dispute the strong showing of unpatentability, the patent owner Michigan Motor Technologies LLC (“MMT”) opted not to defend the challenged claims. MMT did not file a Patent Owner Response (“POR”) and waived its right to dispute the obviousness grounds in the Petition.

In addition to MMT’s waiver, this Reply addresses certain issues discussed in the Institution Decision. First, this Reply confirms that the term “dose” in claims 1 and 8 should be construed as “close.” Second, this Reply confirms that Itabashi discloses “commanding the positioning device to open to a hold open mode and . . . [cl]ose to a hold close mode.” Third, this Reply confirms that the Petition relied on 30 milliseconds for Itabashi’s time period t1 for Ground 3. And finally, this Reply confirms that Matsumoto, Burney, and Ritenour *all* disclose “detecting a control effort required to change to said commanded position.”

II. MMT WAIVED ALL ARGUMENTS TO DISPUTE THE OBVIOUSNESS OF CLAIMS 1-20.

MMT elected not to file a POR, instead choosing only to file a Motion to Amend. Contrary to the Board’s Scheduling Order and the Trial Practice Guide,

MMT did not arrange a conference call to notify the Board it would not be filing a POR. *See* Paper 10, 11 (“If Patent Owner elects not to file a response, Patent Owner must arrange a conference call with the parties and the Board.”); Consolidated Trial Practice Guide (Nov. 2019) (“CTPG”), 66 (a patent owner “will” arrange for a conference call). As a result, it is unclear whether MMT will file a request for adverse judgement for original claims 1-20. *See* CTPG, 66; 37 C.F.R. § 42.73(b). But even if MMT is not requesting adverse judgment, MMT has waived all arguments supporting patentability of claims 1-20. For example, the Board should not permit MMT, in a Patent Owner Sur-reply, to address for the first time post-institution the patentability of claims 1-20. Doing so would circumvent the Board’s trial procedures and leave Petitioner without a meaningful opportunity to respond.

MMT was on notice and waived any argument against the obviousness challenges in the Petition. *See* Paper 10, 10 (“Patent Owner is cautioned that any arguments for patentability not raised in the response may be deemed waived.”). This includes the arguments that MMT advanced in its preliminary response. *See* CTPG, 52; *In re Nuvasive, Inc.*, 842 F.3d 1376, 1381 (Fed. Cir. 2016) (a patent owner waives an issue presented in its preliminary response if it fails to renew the issue in its response after trial is instituted). Indeed, in similar circumstances where the Board cautioned that arguments “not raised in the response may be deemed

waived,” the Board indicated that “Patent Owner waived those issues presented in its Preliminary Response by not filing a patent owner response.” *Intel Corp. v. Hera Wireless S.A.*, IPR2018-01701, Paper 25, 2 n.1 (Apr. 29, 2020); *see also Toshiba Corp. v. Optical Devices, LLC*, IPR2014-01441, Paper 36, 15 n.5 (Mar. 8, 2016) (“Patent Owner waived any arguments for patentability based on the claim constructions presented in the Decisions on Institution, but unchallenged in the Motion to Amend, when it opted not to file a Patent Owner Response.”).

As the Board correctly found in its Institution Decision, the Petition demonstrated a reasonable likelihood that claims 1-20 would have been obvious. *See* Paper 9 (“DI”), 17-45. Throughout the Institution Decision, the Board pointed out instances where the “Patent Owner does not address this limitation” or where “Patent Owner does not make any arguments regarding these [dependent] claims separate from its argument [for the independent claims].” *E.g.*, DI, 18, 20, 21, 25-27, 30. Now that the time for filing a POR has passed, MMT missed its opportunity to raise such disputes and arguments. And even those disputes and arguments MMT previously raised are now waived. *See* CTPG, 52; *In re Nuvasive*, 842 F.3d at 1381; *Intel*, IPR2018-01701, Paper 25, 2 n.1. In any event, the obviousness grounds for claims 1-20 set forth in the Petition and supported by Dr. Micklow’s Declaration (EX1003) are unrebutted.

By failing to file a POR, MMT does not—and no longer can—dispute the

teachings of the prior art or argue that any claim element of claims 1-20 is not taught or suggested by the prior art. And for the same reason, MMT does not and cannot dispute any of the Petition's obviousness rationales, including the Petition's reasons to modify or combine the teachings of Matsumoto, Burney, and Ritenour and the Petition's explanations regarding reasonable expectation of success. Nor does MMT provide any evidence of secondary considerations of non-obviousness. Ultimately, MMT has waived *all* arguments regarding the obviousness challenges to claims 1-20 set forth in the Petition and supported by the Micklow Declaration.

In light of the unrebutted, evidence-supported showing of obviousness in the Petition, Petitioner has met its burden of proving that claims 1-20 are unpatentable by a preponderance of the evidence. *See* 35 U.S.C. § 316(e).

III. REPLY TO THE INSTITUTION DECISION

This Reply responds to four issues discussed in the Institution Decision. “[T]he Board will permit the petitioner, in its reply brief, to address issues discussed in the institution decision.” CTPG, 73. “The absence of a patent owner response will *not* prevent a petitioner from filing a reply where appropriate to address the institution decision.” PTAB Rules of Practice, 85 Fed. Reg. 79120,

79124 (Dec. 9, 2020) (emphasis added).¹

A. Claim Construction: The term “dose” in claims 1 and 8 is the result of a typographical error and should be “close.”

In the Institution Decision, the Board agreed that the term “dose” in claims 1 and 8 should be “close.” DI, 10-12 (citing Paper 1 (“Pet.”), 7). MMT does not dispute that “dose” is the result of a typographical or clerical error and should be interpreted as “close.” Accordingly, based on the full record, the Board should issue a final decision construing “dose” as “close.”

B. Ground 1: Itabashi teaches or suggests the claimed “hold open” and “hold close” modes.

With respect to Ground 1, the Institution Decision discusses whether Figures 3 and 4 of Itabashi show commanding a throttle valve to its *fully* open and *fully* closed positions. DI, 22-23. As discussed below, the record demonstrates that Itabashi’s system commands the throttle valve to target positions within and including the fully open and fully closed positions. But even if Itabashi’s system did not command the throttle valve to these positions, the claims do not require commanding the positioning device to any specific position, such as fully open or fully closed. And the disclosures of Itabashi discussed in the Petition demonstrate

¹ The revised rules published on December 9, 2020 “conform to the current standard practice.” 85 Fed. Reg. at 79120.

that Itabashi teaches or suggests the claimed “hold open” and “hold close” modes.

Below, VW provides a brief discussion of the claims and then turns to Itabashi’s teachings.

1. The claims do not require commanding the positioning device to any specific position, such as *fully* open or *fully* closed.

The claims do not require commanding the “positioning device” to any specific position, such as *fully* open or *fully* closed. Independent claims 1 and 11 require “commanding [or control logic operative to command] the positioning device to change to a commanded position,” EX1001, 5:17-18, 6:14-16, but do not define the “commanded position.” The dependent claims likewise do not define or further limit the “commanded position.”

Claim 1 also recites commanding the positioning device to open or close: “wherein commanding the positioning device to change to said commanded position comprises *at least one of* commanding the positioning device to *open* to a hold open mode and commanding the positioning device to *[cl]ose* to a hold close mode.” EX1001, 5:27-31. Similarly, claim 11 recites “command[ing] the positioning device to *close* to said commanded position in a hold close mode.” EX1001, 6:23-24. But the claims also do not require “open” to mean fully open or “close” to mean fully closed. Nor do the claims or anything in the intrinsic record define the “hold open” and “hold close” modes to require the “positioning device”

be commanded to move to a fully open or fully closed position, respectively.

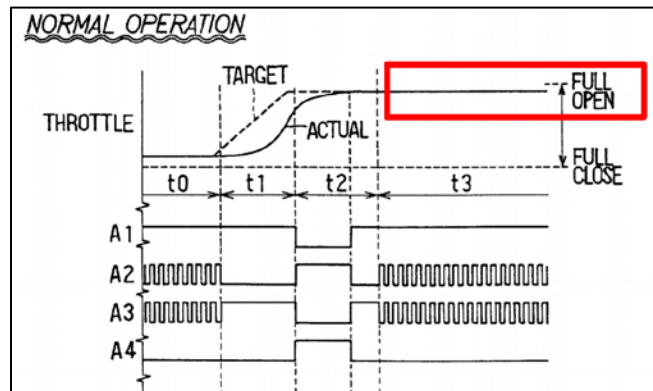
Additionally, the patentee neither acted as its own lexicographer nor disavowed claim scope. *See Cont'l Circuits LLC v. Intel Corp.*, 915 F.3d 788, 796-97 (Fed. Cir. 2019). Nor has MMT proposed a construction that deviates from the plain and ordinary meaning.

Accordingly, the claims require commanding the “positioning device,” such as a throttle valve, to a “commanded position,” which is undefined and may be something less than the fully open or fully closed positions.

2. In any event, a POSA would have understood that Itabashi teaches or suggests commanding a throttle valve to move to target positions, including fully open and fully closed.

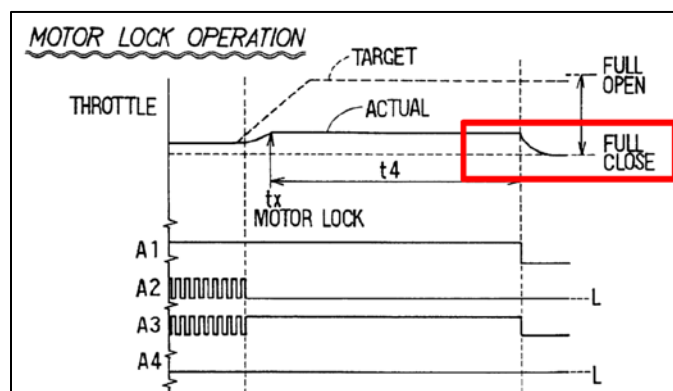
The Board was correct in the Institution Decision that “the entire record as developed thus far supports Petitioner’s assertion that it would have been obvious to command Itabashi’s throttle valve to change to a fully open or a fully closed position.” *See* DI, 24. MMT did not present rebuttal evidence showing otherwise. And the discussion below further confirms that Itabashi teaches or suggests commanding the throttle valve to target positions within and including the fully open and the fully closed positions. Accordingly, to the extent necessary to hold the claims unpatentable, the Board should issue a final decision finding that it would have been obvious to command Itabashi’s throttle valve to change to a fully open position and a fully closed position.

The Petition explained that Itabashi's command signals A1-A4 command the throttle to move to and hold at an open position, as the timing diagram shows below. *See Pet.*, 28.



EX1007, FIG. 3 (excerpted and annotated).

The Petition also showed that “[c]ommand signals A1-A4 can also command the throttle to close to a hold close mode because the range of movement of the throttle valve is from ‘FULL OPEN’ to ‘FULL CLOSE.’” *Pet.*, 28.



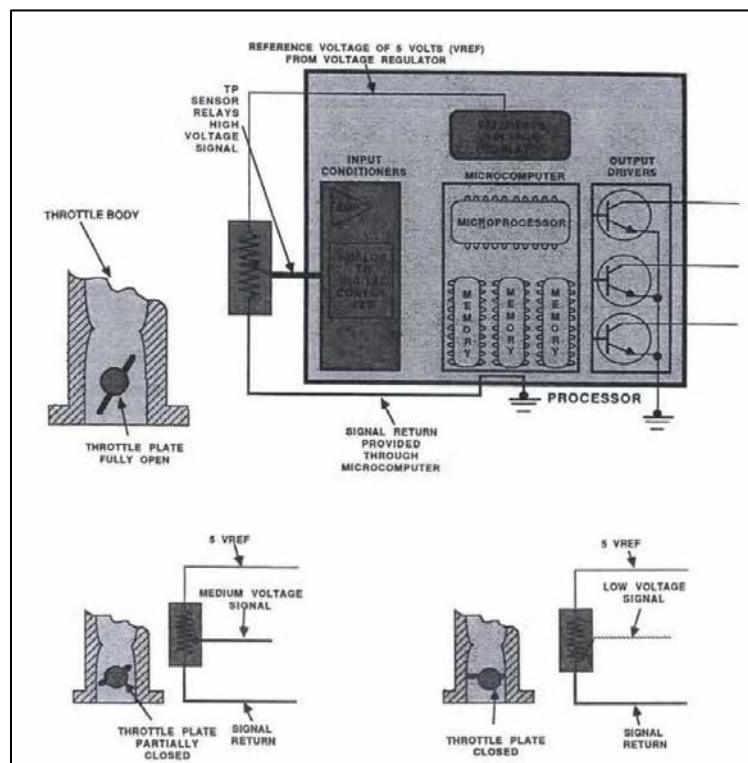
EX1007, FIG. 4 (excerpted and annotated).

Figure 4 of Itabashi shows commanding the throttle to its FULL CLOSE position—not “slightly above the full close position.” *Compare* EX1007, FIG. 4,

with DI, 23. The Board preliminarily found that “none of Petitioner’s citations to Itabashi’s disclosure explicitly mention moving the throttle to a fully open *or a fully closed position . . .*” DI, 22 (emphasis added). But as shown in Figure 4 (see above), the actual position of the throttle valve is commanded to its FULL CLOSE position, not slightly above the full close position. EX1003, ¶¶125-26; EX1034, ¶23. The Petition included this annotated figure at page 29.

The Petition also showed that commanding the throttle to a FULL CLOSE position was well known. The Institution Decision states that “Petitioner merely cites to several exhibits without providing sufficient explanation to support the assertion that commanding a throttle to move to a fully closed position was well known.” DI, 23. But the cited teachings show that commanding a throttle valve to fully close was well known and conventional. EX1034, ¶24. For example, cited on page 29 of the Petition, Burney teaches that its system uses “a motor current that causes the motor M to drive in a direction to release the throttle valve so it may close.” EX1006, 14:51-56; *see also* Pet., 29 (citing EX1006, 14:46-56); EX1003, ¶95. If a vehicle is traveling down a steep decline (e.g., when driving through mountains), “[t]he motor M will rotate in a direction that releases the throttle arm 20 (FIG. 1) toward the force of the bias spring 21, allowing the throttle valve (not shown) to move to the idle position.” *See* EX1006, 13:11-19; *see also* EX1006, 11:35-42; EX1034, ¶24. The throttle would then reach the throttle stop at the fully

closed position. See EX1006, 13:20-23. Other references also show that commanding a throttle to fully close was well known. See, e.g., EX1009, 4:14-20 (“The throttle close-limit switch 7A detects that the throttle 5 is driven to its fully-closed position and outputs a throttle fully-closed position signal.”), 4:51-63 (driving the throttle to the extreme position “fully-closed”), 6:27-32 (“the throttle valve is closed”), FIGS. 5-6 (showing a “fully closed” position); EX1016, FIG. 2 (showing a closed throttle angle); EX1011, Abstract, FIGS. 4A-4D (commanding the throttle valve to “close” past its limp-home position); EX1034, ¶25. As an undergraduate textbook on automotive control systems shows below, a conventional throttle controller would command the throttle to fully open, partially close, and fully close:

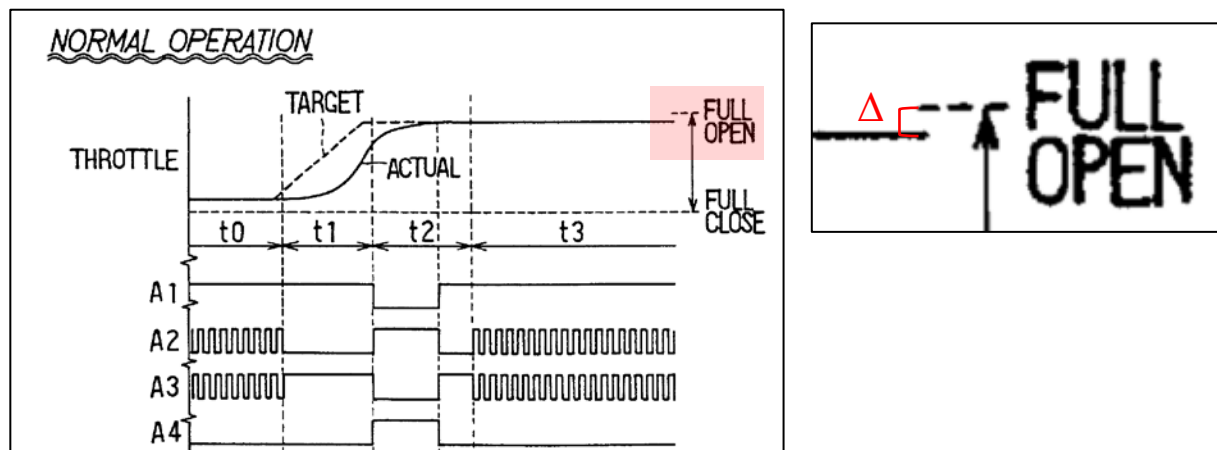


EX1022, 61. As the evidence shows, commanding a throttle to fully close was well known. EX1034, ¶¶24-26. Indeed, the '804 patent recognized that prior systems typically commanded the throttle to fully close to a mechanical limit called a "close stop." See EX1001, 1:36-44; *see also* EX1027, 1:13-14 ("Servosystems are frequently designed to operate between specified limits of mechanical movement.").² The '804 patent states that "the actuator or servomotor used to position the throttle plate is designed to have the maximum control effort available (motor voltage, current, duty cycle) to enhance throttle plate position response." EX1001, 1:36-39. It further states that typical mechanical limits of a throttle plate include "an open stop or a close stop." EX1001, 1:43-44. The '804 patent thus confirms that Itabashi's explicit teachings directed to commanding the throttle valve to close to its fully closed position was indeed well known and conventional. EX1034, ¶26.

A POSA would have also understood that Itabashi would command its

² The Board may rely on statements in the '804 patent as "evidence [of] the general knowledge possessed by someone of ordinary skill in the art." See Memo: Treatment of Statements of the Applicant in the Challenged Patent in Inter Partes Reviews Under § 311, p. 4 (Aug. 18, 2020), *available at* https://www.uspto.gov/sites/default/files/documents/signed_aapa_guidance_memo.pdf.

throttle valve to open to its fully open position. EX1003, ¶¶124-25; EX1034 ¶¶26-30. Whereas Itabashi explicitly shows the actual throttle position at the FULL CLOSE position, Itabashi's Figure 3 shows the actual throttle position slightly below the full open position, as the Board correctly recognized. *See* DI, 23. Petitioner has shown this difference between the target position and the FULL OPEN position below with delta Δ . But as the Board also recognized, "the entire record as developed thus far supports Petitioner's assertion that it would have been obvious to command Itabashi's throttle valve to change to a fully open . . . position." DI, 23-24 (citing EX2001, ¶63).



EX1007, FIG. 3 (excerpted and annotated).

Indeed, it would have been obvious to command Itabashi's throttle valve to change to a fully open position because Itabashi's figures show the FULL OPEN position, which suggests that the system commands the throttle to fully open. *See* DI, 23; EX1034, ¶28. As VW's expert witness Dr. Micklow testified, commanding

a throttle to fully open was well known. *E.g.*, EX1003, ¶¶63-64; EX1034, ¶28. And a POSA would have understood that the TARGET position shown in Figure 3 is just an example; the target position varies based on the position of the accelerator pedal. EX1007, 3:7-10; EX1034, ¶28. Said another way, a POSA would have understood that Itabashi's TARGET position may fall anywhere in the range from FULL CLOSE to FULL OPEN, inclusive of the limits. EX1034, ¶31. Furthermore, the '804 patent also confirms that commanding a throttle valve to its fully open position was well known. EX1034, ¶26 (citing EX1001, 1:43-44).

For these reasons, Itabashi teaches *both* commanding the throttle valve to fully open and commanding the throttle valve to fully close. EX1034, ¶¶27-31.

3. Even if Itabashi did not command the throttle valve to fully open or fully close, Itabashi still teaches or suggests the claimed “hold open” and “hold close” modes.

Even if Itabashi does not move the throttle valve to fully open or fully close, Itabashi still teaches or suggests the claimed hold open and hold close modes. *See* Pet., 27-30. Itabashi's controller applies a maximum control effort to open and to close the throttle valve. As Itabashi states, “[a] direct current motor for an engine throttle control is driven with a motor current of 100% duty ratio, when a throttle

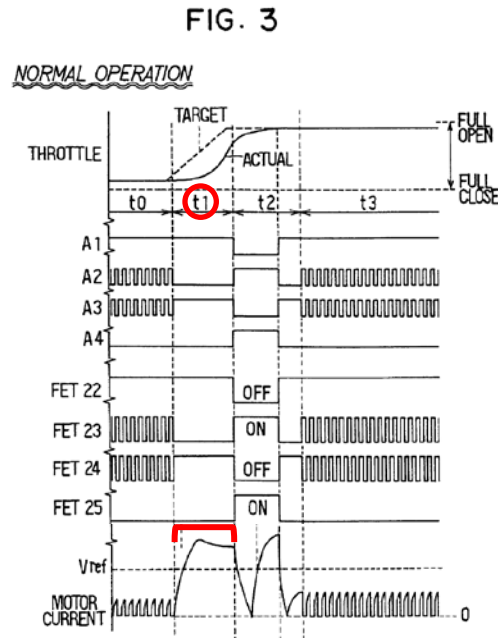
valve is to be moved from one throttle position to another”³ EX1007,

Abstract; *see also* EX1007, 1:21-23. Itabashi shows in Figure 3 (reproduced in part below) the system applying a maximum control effort when commanding the throttle to open during time period t1. *See* EX1007, 6:46-55, FIG. 3; EX1003, ¶134. As Itabashi states, “[i]n the case that the target throttle position is changed with the movement of the accelerator pedal 16, the engine control circuit 15 drives the motor 13 with the motor current of 100% duty ratio during the time period t1 so that the actual throttle position approaches the target throttle position in a short period of time.” EX1007, 6:46-51.

Specifically, Figure 3 shows command signals A1 and A3 driving FETs 22 and 24, respectively, high during t1; while command signals A2 and A4 drive FETs 23 and 25, respectively, low during the t1—driving the motor at 100% duty ratio and applying maximum current in order to open the throttle from its position at t0 to the TARGET position. EX1007, FIG. 3. The throttle is held open at the TARGET position during period t3. EX1007, FIG. 3; *see also* Pet., 28 (“The

³ A POSA would have understood that moving from one throttle position to another includes moving the throttle in the opening direction (from a less open to a more open position, including fully open) and in the closing direction (from a more open to a less open position, including fully closed). EX1034, ¶78.

command signals A1-A4 hold the throttle open because ‘[a]s long as the throttle valve 12 is maintained at the target position during the period t3, the motor 13 is driven with the duty-controlled motor current in the same manner as in the period t0.’” (citing EX1007, 7:10-13)).



EX1007, FIG. 3 (excerpted and annotated)

As the Petition explained, Itabashi also teaches, or it at least would have been obvious, that Itabashi’s signals A1-A4 command the throttle to close to a hold close mode. Pet., 28-30; EX1003, ¶¶124-29. Itabashi teaches that the system can drive the motor “with the motor current of 100% duty ratio in the reverse direction” than the direction shown in Figure 3, i.e., the direction necessary to close the throttle valve. EX1007, 7:57-59; EX1034, ¶¶69-72. As the Petition explained for claims 1 and 8, “[t]he timing diagram [for an example closing of the

throttle] would be the inverse of” opening shown in Figure 3. Pet., 32.

As these teachings show, Itabashi’s engine control circuit applies a maximum control effort to open and close the throttle. For this additional reason, Itabashi discloses both (1) “commanding the positioning device to open to a hold open mode and commanding the positioning device to [cl]ose to a hold close mode” as recited in claim 1 and (2) “control logic operative to command the positioning device to close to said commanded position in a hold close mode” as recited in claim 11.

C. Ground 3: The Board was correct that the Petition relied on 30 milliseconds for Itabashi’s time period t1.

In the Institution Decision, the Board was correct in its understanding when stating: “We understand Petitioner to argue that it would have been obvious to use 30 milliseconds for the length of Itabashi’s time period t1, during which Petitioner argues Itabashi applies maximum effort.” DI, 32.

As the Petition explained for claim 4, “Itabashi discloses [‘applying a maximum control effort to the positioning device for a hard open time period’] because ‘the engine control circuit 15 drives the motor 13 with the motor current of 100% duty ratio *during the time period t1 . . .*’” Pet., 30 (quoting EX1007, 6:46-51) (emphasis changed). The Petition also relied on t1 for the “hard [cl]ose time period” in claim 8. Pet., 32. Then, for Ground 3, the Petition argued that “selecting 30 milliseconds for both the hard open time period and hard close time period

would have been an obvious design choice.” Pet., 48. As these excerpts show, the Petition relied on 30 milliseconds for Itabashi’s time period t1.

D. Ground 4: All three references disclose “detecting a control effort required to change to said commanded position.”

Matsumoto, Burney, and Ritenour *all* disclose “detecting a control effort required to change to said commanded position,” as recited in claim 1. These references also disclose “a control effort detector . . . intended to detect said control effort,” as recited in claim 11. As the Petition explains, Matsumoto’s throttle actuator “detects” the control effort. *See* Pet., 57-58, 71. Burney’s limit *detection* circuit and motor drive circuit both “detect” the control effort. *See* Pet., 58-60, 71. And Ritenour’s system from the 1980s shows how using a circuit to reduce current when current exceeds a threshold for a predetermined time period was well known and obvious by 2001. *See* Pet., 49, 60. The Board thus correctly found in the Institution Decision that Ground 4 supports Petitioner’s contentions, DI, 37 (“Matsumoto supports Petitioner’s contentions [and] Burney supports Petitioner’s contentions.”), and should issue a final decision that maintains these findings.

1. Matsumoto’s throttle control servomotor detects the control effort.

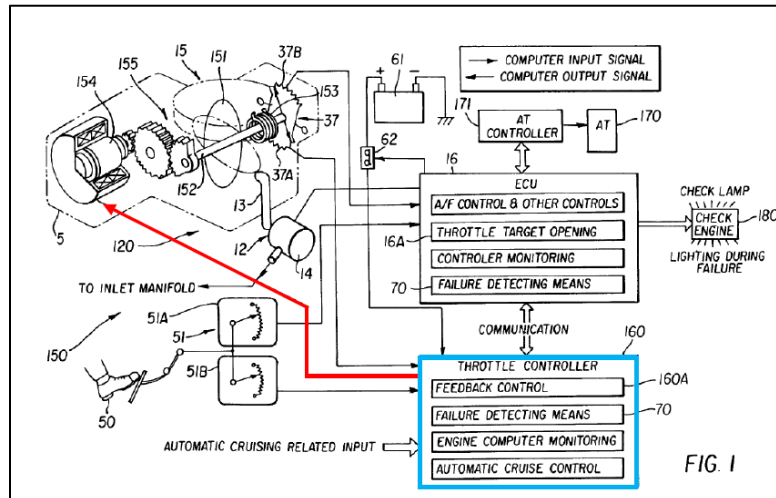
For the detecting element, the Board stated that “Matsumoto supports Petitioner’s contentions” but that “[w]hether this ‘detecting’ of the electric current by motor 154 is the same type of ‘detecting’ as recited in claim 1 of the ’804 patent

is an issue to be resolved at trial.” DI, 37. As the Petition explained, Matsumoto’s “detecting” is the same detecting recited in claims 1 and 11 of the ’804 patent. *See* Pet., 57-58. MMT has not presented any rebuttal evidence or argument otherwise. Accordingly, the Board should issue a final decision finding that Matsumoto teaches or suggests the “detecting” recited in claims 1 and 11.

The ’804 patent does not define “detecting.” The ’804 patent merely refers to a general, black-box sensor and concludes that the sensor “detects” a control effort. EX1001, Abstract. At other times, the specification uses the passive voice when referring to the detecting element. *See* EX1001, 2:4-6 (“The control effort required to change to the commanded position is detected.”). Without an express definition or any intrinsic evidence supporting a narrower construction, the plain and ordinary meaning should control. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005).

Under the plain and ordinary meaning, Matsumoto’s servomotor (also called a throttle actuator) “detects” the control effort. Pet., 57-58. In Matsumoto, the servomotor identifies that the control effort is present. EX1003, ¶193. After the throttle opening feedback control portion 160A determines the control effort required to move the throttle to a desired position, the throttle controller 160 then drives the throttle actuator 154 with the control effort. Pet., 57 (citing EX1008, 7:51-56, FIGS. 1, 3). “The throttle actuator 154 therefore ‘detects’ the presence

and magnitude of the drive current and uses that current to move the throttle.” Pet., 57-58; EX1003, ¶193.



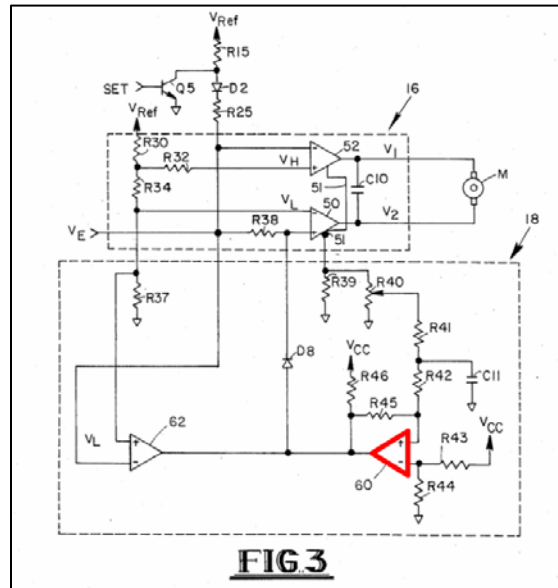
EX1008, FIG. 1 (annotated).

2. Burney’s limit detection circuit detects the control effort.

Even if the Board were to find, incorrectly in Petitioner’s view, that Matsumoto does not disclose the detecting element, Burney unequivocally does. Burney discloses the detecting element in both (1) the limit *detection* circuit 18 and (2) the motor drive circuit 16. See Pet., 58-60, 71.

First, amplifier 60 in the limit detection circuit 18 “detects” the control effort required to move the throttle to the commanded position. As the Petition stated, “Burney’s limit detection circuit 18 includes an amplifier 60.” Pet., 58 (citing EX1006, 10:21-24, FIG. 3). “Amplifier 60 detects the control effort required to change to said commanded position because the voltage applied to the noninverting (+) input ‘is directly related to the drive current of the motor M.’”

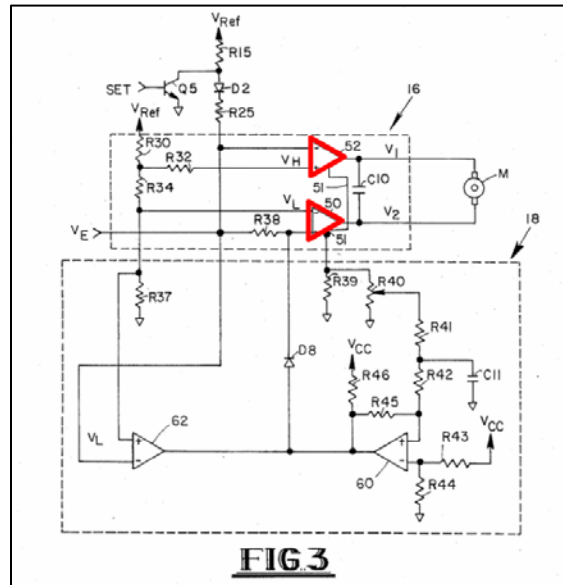
Pet., 58 (quoting EX1006, 10:29-34). As the Petition explained and as shown below, amplifier 60 discovers or identifies that the control effort required to move the throttle to the commanded position is present. Pet., 58-59.



EX1006, FIG. 3 (annotated).

Second, amplifiers 50 and 52 in the motor drive circuit 16 “detect” the control effort required to move the throttle to the commanded position. See Pet., 59-60. In Burney, “the error voltage V_E is received from R35 (FIG. 2) and is compared by each of the amplifiers 50 and 52 to DC voltage levels produced by a voltage divider” EX1006, 9:16-23. When the error voltage V_E drops below the low voltage level V_L , “a motor current flows through the motor M to cause it to rotate.” EX1006, 9:66-10:8. Dr. Micklow explained in detail how Burney’s motor drive circuit works and concluded that the amplifiers 50 and 52 “detect” the control effort required to move the throttle to the commanded position. See EX1003, ¶¶95,

195. For the reasons in the Petition and Dr. Micklow's declaration, amplifiers 50 and 52 identify that the control effort required to move the throttle to the commanded position is present.



EX1006, FIG. 3 (annotated).

3. Ritenour's servomotor drive circuit detects the control effort.

Ritenour also discloses the “detecting” element. See Pet., 60 (citing EX1027, 1:30-35, 2:12-40; EX1003, ¶196). In Ritenour, “[a] servosystem drive circuit includes means for sensing instances when the servomotor drive current exceeds a preset threshold level for a given time” EX1027, 1:30-35. Ritenour also states that its circuit “monitors the current to the motor” EX1027, Abstract. As Dr. Micklow testified, this circuit detects the control effort required to move a positioning device. EX1003, ¶¶100, 196. MMT has not disputed this.

Matsumoto, Burney, and Ritenour—all the references in Ground 4—disclose “detecting a control effort required to change to said commanded position” as recited in claim 1 and “a control effort detector . . . intended to detect said control effort” as recited in claim 11. The Board should issue a final decision that maintains its finding that Ground 4 satisfies the detecting element.

IV. CONCLUSION

All claims of the '804 patent are unpatentable. The Petition presented substantial evidence to support a finding of unpatentability for each claim, as the Board correctly recognized in the Institution Decision. *E.g.*, DI, 17 (“Itabashi supports Petitioner’s contentions.”), 35 (“Matsumoto supports Petitioner’s contentions.”), 37 (“Burney supports Petitioner’s contentions.”). MMT did not proffer rebuttal arguments or evidence, and thus more than a preponderance of the evidence demonstrates that the claims are unpatentable. *See In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1376 n.1 (Fed. Cir. 2016) (“We note, however, that while the institution of an IPR does not by itself translate to a conclusion of unpatentability and the patent owner is not required to use its opportunity under the regulations to file a patent owner response, as in district court validity challenges, *the patent owner would be well advised to introduce evidence on the asserted challenge.*” (emphasis added; internal quotation omitted)).

Respectfully submitted,

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**CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITATION,
TYPEFACE REQUIREMENTS, AND TYPE STYLE REQUIREMENTS**

1. This Petitioner's Reply complies with the type-volume limitation of 5,600 words, comprising 4,516 words, excluding the parts exempted by 37 C.F.R. § 42.24(c).

2. This Petitioner's Reply complies with the general format requirements of 37 C.F.R. § 42.6(a) and has been prepared using Microsoft® Word 2016 in 14 point Times New Roman.

Respectfully submitted,

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CERTIFICATION OF SERVICE

The undersigned hereby certifies that true and correct copies of the above-captioned **PETITIONER VOLKSWAGEN GROUP OF AMERICA, INC.’S**
REPLY TO THE INSTITUTION DECISION and accompanying **EXHIBIT**
1034 were served electronically via email in their entireties on February 9, 2021,
upon the following parties:

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