
UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ZF NORTH AMERICA, INC., ZF ACTIVE SAFETY US INC.,
Petitioners,

v.

STONERIDGE CONTROL DEVICES, INC.,
Patent Owner.

Inter Partes Review No. IPR2023-00273
Patent No. 7,021,415

PATENT OWNER RESPONSE

TABLE OF CONTENTS

TABLE OF CONTENTS.....	i
TABLE OF AUTHORITIES	iv
TABLE OF EXHIBITS	viii
I. INTRODUCTION	1
II. BACKGROUND OF THE '415 PATENT	4
A. Generally	4
B. Sub-Frame	6
C. Isolators	8
1. Sub-frame/motor isolator	10
2. Sub-frame/gear set isolator	12
3. Sub-frame/housing isolator	13
III. LEVEL OF ORDINARY SKILL	13
IV. CLAIM CONSTRUCTION	16
A. Sub-frame	16
B. Actuator housing	19
V. NON-OBVIOUSNESS OF CHALLENGED CLAIMS	22
A. Ground 1 – Poertzgen in view of Boucheret does not support obviousness of claims 5, 7, 8, or 14-19.....	23
1. Poertzgen.....	23
2. Boucheret.....	25

3. Claim 5 is not obvious over Poertzgen and Boucheret— No Motivation.....	29
4. Claim 5—No sub-frame	38
5. Claim 7 is not obvious over Poertzgen and Boucheret	40
6. Claim 8 is not obvious over Poertzgen and Boucheret	41
7. Claims 14 and 15 are not obvious over Poertzgen and Boucheret	42
8. Claim 16 is not obvious over Poertzgen and Boucheret	43
9. Claims 17 is not obvious over Poertzgen and Boucheret	43
10. Claims 18 and 19 are non-obvious.....	44
B. Ground 2 – Poertzgen in view of Boucheret and Drennen does not support obviousness of claims 5, 7, 8, or 14-19	48
C. Ground 3 – Poertzgen in view of Boucheret and Weiler does not support obviousness of claims 5, 7, 8, or 14-19	49
D. Ground 4 – Weiler does not support obviousness of claims 24 or 25	49
1. Weiler	50
2. Bearing bush is not an “isolator,” and lack of motivation	52
3. The “actuator housing” does not read on Weiler’s caliper	54
4. Petitioners have not addressed redundancy	55
E. Ground 5 – Weiler in view of Boucheret does not support obviousness of claims 24 or 25	58
VI. EVIDENCE OF NON-OBVIOUSNESS	60
A. Copying	60
B. Praise	61

C. Commercial success	61
D. The Evidence of Non-Obviousness is Substantial	63
VII. NO JURISDICTION	63
VIII. NOT CONSTITUTIONAL	65
A. IPRs Violate Due Process Rights	65
B. The Institution Procedure Violates the Appointments Clause	67
CERTIFICATE OF COMPLIANCE	70
CERTIFICATE OF SERVICE	71

TABLE OF AUTHORITIES

Cases	Page(s)
<i>ActiveVideo Networks, Inc. v. Verizon Communs., Inc.</i> , 694 F.3d 1312 (Fed. Cir. 2012)	34
<i>Arendi S.A.R.L. v. Apple Inc.</i> , 832 F.3d 1355 (Fed. Cir. 2016)	47
<i>Brown & Williamson Tobacco Corp. v. Philip Morris, Inc.</i> , 229 F.3d 1120 (Fed. Cir. 2000)	61, 62
<i>CAE Screenplates, Inc. v. Heinrich Fiedler Gmbh & Co. KG</i> , 224 F.3d 1308 (Fed. Cir. 2000)	17, 20
<i>Chemours Co. FC, LLC v. Daikin Indus.</i> , Nos. 2020-1289, 2020-1290, 2021 U.S. App. LEXIS 21690 (Fed. Cir. July 22, 2021)	34
<i>Graham v. John Deere Co.</i> , 383 U.S. 1 (1966)	45
<i>Haemonetics Corp. v. Baxter Healthcare Corp.</i> , 607 F.3d 776 (Fed. Cir. 2010)	18, 21
<i>In re Anova Hearing Labs, Inc.</i> , 809 F. App'x 840 (Fed. Cir. 2020)	30
<i>In re Kahn</i> , 441 F.3d 977 (Fed. Cir. 2006)	35
<i>In re Kotzab</i> , 217 F.3d 1365 (Fed. Cir. 2000)	33
<i>In re NuVasive, Inc.</i> , 842 F.3d 1376 (Fed. Cir. 2016)	34

Cases (cont.)	Page(s)
<i>In re Smith Int'l, Inc.</i> , 871 F.3d 1375 (Fed. Cir. 2017)	16, 18, 20, 21
<i>In re Wilson</i> , 424 F.2d 1382 (CCPA 1970)	48
<i>InTouch Techs., Inc. v. VGO Commc'ns, Inc.</i> , 751 F.3d 1327 (Fed. Cir. 2014)	35
<i>KSR Int'l Co. v. Teleflex Inc.</i> , 550 U.S. 398 (2007)	35, 45
<i>Merck Sharp & Dohme Corp. v. Wyeth LLC</i> , 792 F. App'x 813 (Fed. Cir. 2019)	32
<i>Microsoft Corp. v. i4i Ltd. P'ship</i> , 564 U.S. 91 (2011).....	64
<i>Mobility Workx, LLC v. Unified Patents, LLC</i> , 15 F.4th 1146 (Fed. Cir. 2021)	66, 68
<i>Oil States Energy Servs., LLC v. Greene's Energy Grp., LLC</i> , 138 S. Ct. 1365 (2018).....	63
<i>PersonalWeb Techs., LLC v. Apple, Inc.</i> , 848 F.3d 987 (Fed. Cir. 2017)	31
<i>Phillips v. AWH Corp.</i> , 415 F.3d 1303 (Fed. Cir. 2005)	17, 20
<i>Rexnord Corp. v. Laitram Corp.</i> , 274 F.3d 1336 (Fed. Cir. 2001)	18

Cases (cont.)	Page
<i>Stryker Corp. v. Karl Storz Endoscopy America, Inc.</i> , IPR2015-00764, Paper 13 at 13 (September 2, 2015)	57
<i>TQ Delta, LLC v. Cisco Sys.</i> , 942 F.3d 1352 (Fed. Cir. 2019)	34
<i>Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.</i> , 699 F.3d 1340 (Fed. Cir. 2012)	60
<i>TRW Automotive U.S. LLC v. Magna Electronics, Inc.</i> , IPR2015-00972 (September 16, 2015)	56
<i>United States v. Arthrex, Inc.</i> , 141 S. Ct. 1970 (2021)	68
<i>W.L. Gore & Assocs., Inc. v. Garlock, Inc.</i> , 721 F.2d 1540 (Fed. Cir. 1983)	35
<i>Ward v. Vill. of Monroeville</i> , 409 U.S. 57 (1972)	66
 Statutes	 Page(s)
35 U.S.C. § 314	67, 68
35 U.S.C. § 316	64
 Rules	 Page
37 C.F.R. § 1.530	65
37 C.F.R. § 42.121	64, 65

Other Authorities	Page
<i>Changes to Implement Inter Partes Review Proceedings, Post-Grant Review Proceedings, and Transitional Program for Covered Business Method Patents</i> , 77 Fed. Reg. 48612, 48647 (Aug. 14, 2012)	68
MPEP § 2143	38
PTAB Consolidated Trial Practice Guide (Nov. 2019)	15
USPTO Aggregate Revenue Tables	66

TABLE OF EXHIBITS

Exhibit	Description
2001	Statutory disclaimer under 35 U.S.C. 253(a)
2002	FR 2 693 779 to Ralf-Michael, <i>et al.</i>
2003	Certified Translation of FR 2 693 779
2004	Government Accountability Office Report to the Subcommittee on Courts, Intellectual Property, and the Internet, Committee on the Judiciary, House of Representatives
2005	Declaration of Jeffrey L. Stein, Ph.D.
2006	CV of Jeffrey L. Stein, Ph.D.
2007	Transcript of Deposition of Bruno Lequesne, Ph.D.
2008	U.S. Patent No. 6,397,981 to Tamasho, <i>et al.</i>
2009	Mopar.com listing for Park Brake Actuator (Part No. 68225300AB), viewed August 7, 2023
2010	ZF Press Release dated May 23, 2022
2011	Declaration of Rolf Patrick
2012	Stoneridge, Inc. presentation to TRW, dated February 21, 2003
2013	E-Motors advertisement (Exhibit 4 from Deposition of Lequesne)
2014 ¹	Placeholder - Physical Exhibit Retained By Counsel (Exhibit 5 from Deposition of Lequesne)
2015	Collection of Photographs of Physical Sample of TRW EPBA (i.e., Photos of Ex. 2014; Exhibit 6 from Deposition of Lequesne)
2016	Exhibits A and B from Patent Owner’s Infringement Contentions, served in <i>Stoneridge Control Devices, Inc. v. ZF North America, Inc. et al.</i> , U.S. District Court for the Eastern District of Michigan, Case No. 2:22cv10289
2017	“Electric Parking Brake (EPB) System Market...” from https://www.einpresswire.com/article/632662740/electric-parking-brake-epb-system-market-projected-to-reach-usd-6-07-billion-by-2032-with-7-3-cagr-i-reports-and-data

¹ Patent Owner emailed the Board on July 28, 2023 asking how to handle custody of this physical exhibit. *See* Ex. 2019. Patent Owner’s counsel is currently maintaining custody of the physical exhibit. *Id.*

2018	“Electric Parking Brake Market is Expanding at a CAGR of...” from https://www.globenewswire.com/news-release/2023/7/5/2699470/0/en/Electric-Parking-Brake-Market-is-Expanding-at-a-CAGR-of-12-4-to-Cross-US-5-92-Billion-by-2033-Fact-MR.html
2019	Email dated July 28, 2023 from Patent Owner’s counsel to Board asking how Board would like to handle custody of physical exhibit 2014
2020	The Board’s default protective order

I. INTRODUCTION

Petitioners' attempts should fail for three main reasons:

- 1) They seek to add isolators to several locations in the devices of Poertzgen or Weiler without any evidence, or even a claim, that there would be vibration at the locations where they propose to add isolators, let alone vibration that requires damping;
- 2) They fail to appreciate that Poertzgen and Weiler are precision devices with tight tolerances, and adding isolators would inhibit their operation;
- 3) The problem with adding isolators to Poertzgen and Weiler becomes especially acute once plural isolators are added as required by several claims.

More generally, simply because one could combine prior art elements to reach the claimed invention does not necessarily mean that one would have done so. Motivation to combine requires the latter. In this case, Petitioners have alleged that it would have been obvious to place vibration isolators in the claimed locations because, according to Petitioners, if there is vibration in a location, then it is obvious to place an isolator there. But critically, Petitioners do not prove or even allege that there would be a need or motivation to put an isolator in that location because Petitioners do not and cannot prove that there would be any vibration in those areas

that requires damping. At best, Petitioners have alleged that one could have combined the prior art, but obviousness requires more.

Even if there was vibration that required damping at the locations in question, Petitioners overlook that their chosen base references are precision actuators that would not benefit from the incorporation of vibration isolators. Patent Owner now submits evidence, in the form of testimony of Jeffrey Stein, Ph.D., that the actuators of Poertzgen and Weiler are precision positioning systems including hard-mounted components arranged in close relationships. One would not have added the claimed isolators to these devices, because doing so could introduce motion or misalignments between the various components, which could compromise the precision and overall usability of the actuators, and may ultimately even lead to the creation of vibration and noise.

In fact, the overall tone of the Petition is that because isolators were added to the '415 Patent, there must be vibration at similar locations in the primary references to Poertzgen and Weiler. Of course, this urge to look to the subject patent itself is something that has existed from the beginning of the obviousness standard. But it encourages improper hindsight reconstruction. The '415 Patent is not prior art. Regardless, the EPBA of the '415 Patent is quite distinct from Poertzgen and Weiler. As an example, the sub-frame in the '415 Patent functions and is structured quite

differently than the structures Petitioners allege are sub-frames in Poertzgen and Weiler.

To this end, another problem with the Petitioners' argument is that they actually have improperly read the claimed "sub-frame" on the prior art's actuator housing, and improperly read the claimed "actuator housing" on the prior art's brake caliper. To address these mistakes, Patent Owner also submits evidence of the distinct nature of three claim terms: sub-frame, actuator housing, and brake caliper. Specifically, a sub-frame is not an actuator housing, and an actuator housing is not a brake caliper. The disclosure of the '415 Patent is clear on these points.

Patent Owner also maintains that Petitioners have not considered the full scope of the prior art, namely their secondary reference Boucheret, which teaches a particular type of damper for a fan. While Petitioners' base references disclose actuators for use in precision positioning systems, fans are not precision actuators. As will be explained below, fans can accommodate loose tolerances, which makes them good candidates for incorporating vibration isolators. On the other hand, again, precision actuators cannot readily incorporate vibration isolators because precision mounting and alignment are overriding design concerns.

As support for their positions, Petitioners rely on the opinions of Bruno Lequesne, Ph.D. This is problematic because Dr. Lequesne lacks experience and

knowledge in the key areas of vibration isolators and noise attenuation. Although Dr. Lequesne has commendable credentials in the electrical engineering space, they are not in an area relevant to this matter. This matter is about vibration isolators and noise attenuation, an area where Patent Owner's expert, Dr. Stein, is an expert.

Finally, Petitioners ignore the key effect of secondary considerations. Patent Owner now introduces evidence of copying, industry praise, and commercial success. Specifically, Patent Owner gave a presentation to Petitioners in which Patent Owner explained the benefits of the invention of the '415 Patent. Petitioners soon thereafter copied Patent Owner's design. The copied design was lauded by Petitioners as a "great success story" as Petitioners went on to sell over 200 million units (Ex. 2010).

II. BACKGROUND OF THE '415 PATENT

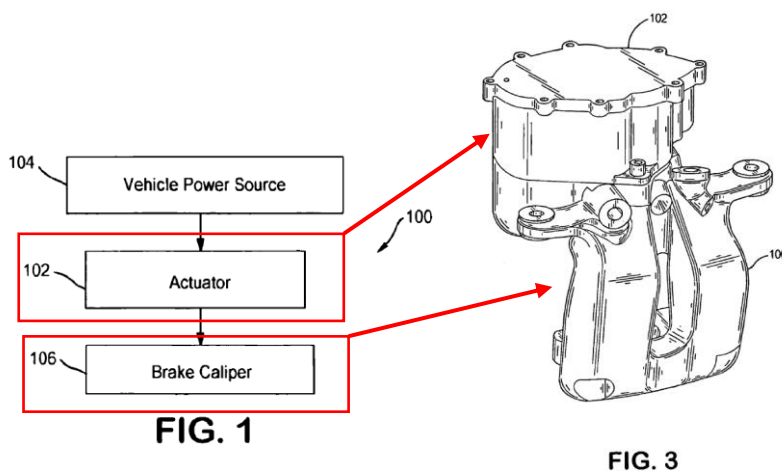
A. Generally

Patent Owner designs, manufactures, and markets electrical and electronic systems, components and modules, primarily for the automotive markets.

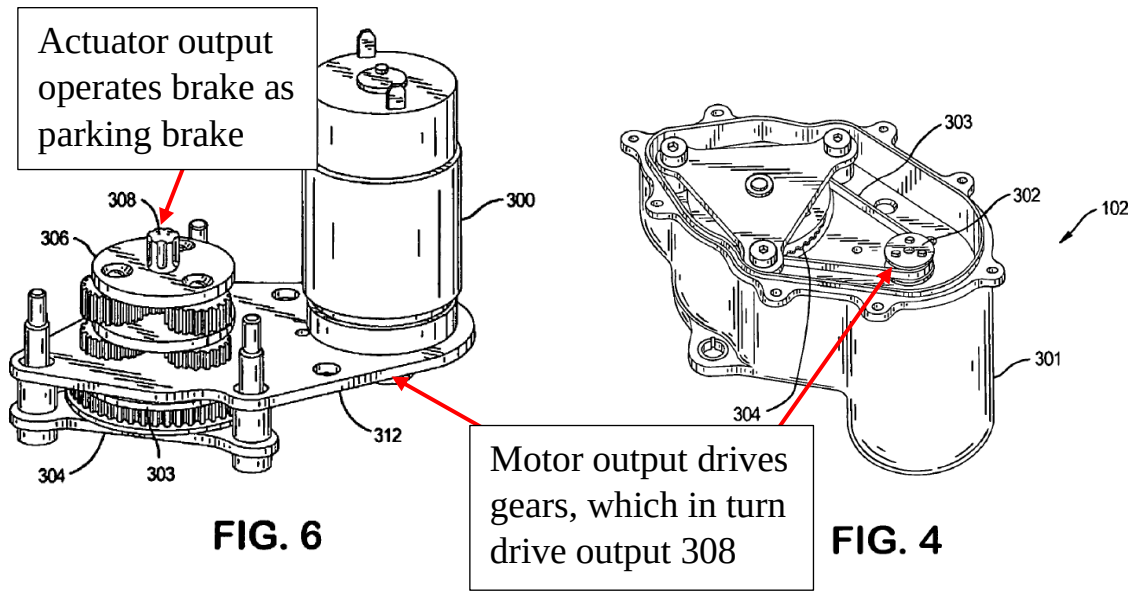
The '415 Patent relates to an electronic parking brake actuator (EPBA) system for a vehicle. An EPBA can be used to actuate a piston of a brake caliper in response to an electrical signal from a parking brake switch. *See, e.g.*, Ex. 1001 at 1:24-45; 2:57-67; 3:1-9. At its most basic level, an EPBA may be thought of as an advancement relative to a manually-operated parking brake actuator, which includes

a mechanical connection (i.e., cable and lever) allowing a user to apply and release the parking brake. Ex. 1001 at 1:25-34.

The disclosed EPBA system 100 includes an actuator 102 configured to receive electrical power and drive a brake caliper 106 to control the parking brake function of a vehicle. Ex. 1001 at 2:60-3:35; Figures 1 and 3 (annotated below).



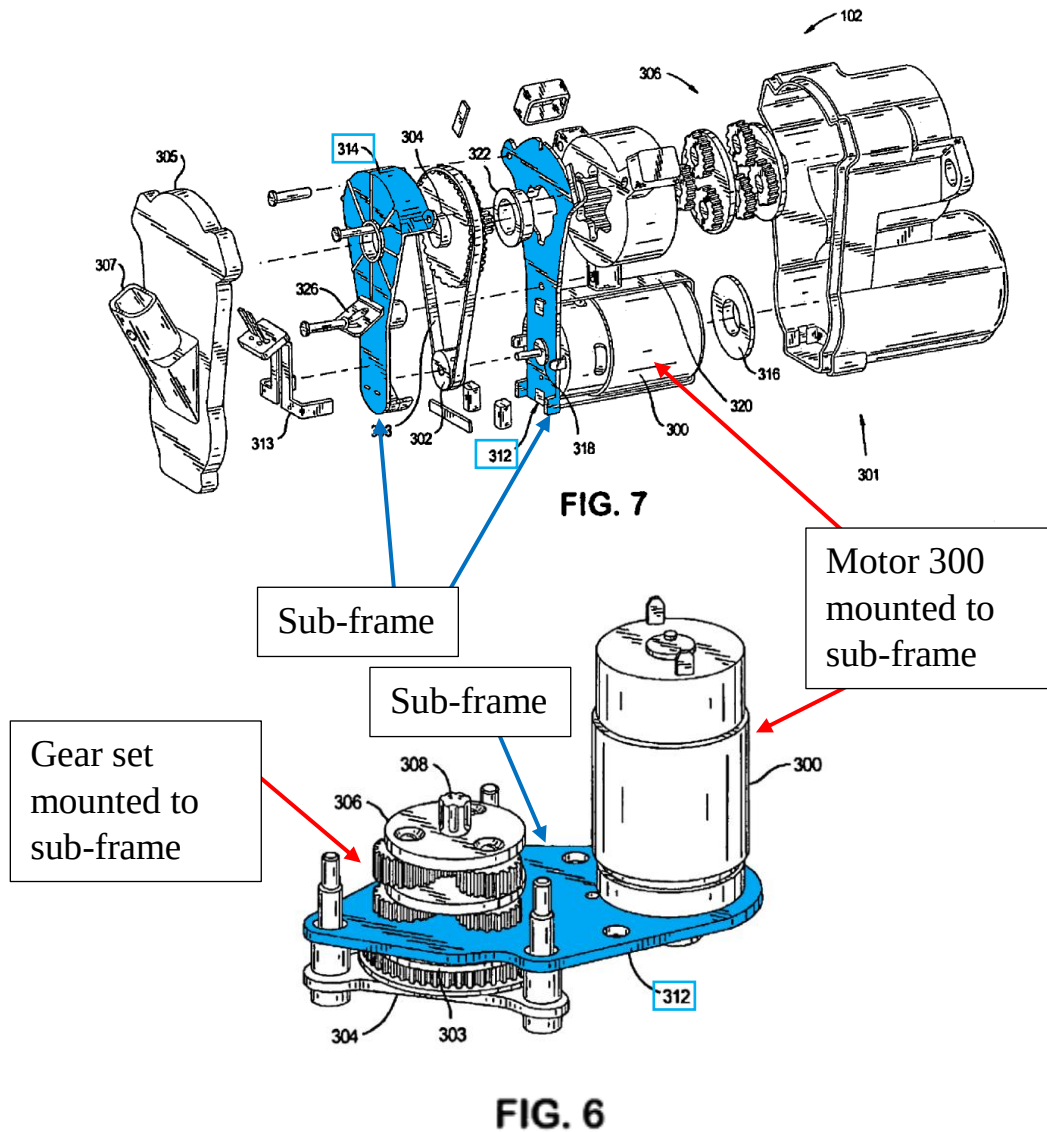
With reference to Figures 4 and 6, annotated below, the actuator 102 includes a motor 300 received in an actuator housing 301. Ex. 1001 at 4:7-6:11; Figures 4 and 6 (annotated below). The shaft of the motor 300 is coupled to a drive pulley 302, which drives a driven pulley 304 via a drive belt 303. *Id.* The driven pulley 304 in turn drives a planetary gear set 306, which drives an output 308 that is ultimately used to operate the caliper 106 as a parking brake. *Id.*



B. Sub-Frame

The sub-frame can be thought of as the core of the EPBA system. It holds various components of the actuator 102, including the motor 300, gear train, and any intervening vibration isolators (which will be discussed below). In other words, the sub-frame is a *frame* for a *sub*-assembly, hence the term sub-frame.

In a particular embodiment of this disclosure, the sub-frame is shown as including a sub-frame lower portion 312 (blue) and sub-frame top portion 314 (blue). *Id.* at 4:7-64; Figures 6 and 7 (annotated below). The claims are not limited to a sub-frame having upper and lower portions.



Mounting the motor 300 and gears 306 to the sub-frame 312 has a number of benefits, including increasing the ease of assembly, handling, and facilitating testing of the actuator 102. *Id.* at 4:44-54. For instance, the motor/gear assembly can be removed from the rest of the actuator as a package (or sub-assembly) without needing to decouple the motor from the gears. Conversely, the motor and gears can be assembled onto the sub-frame outside of the rest of actuator and then installed in

the actuator as a package. Finally, the sub-frame can be made of a material that allows for tuning of the audible noise associated with the EPBA. *Id.* at 7:16-29.

C. Isolators

It is this audible noise that requires the intervention of an isolator. In general, an isolator is a component that isolates. Ex. 2007 at 44:10-15; Ex. 2005 at ¶¶ 70-76. Isolators separate two bodies that would otherwise conduct electricity, heat, or sound, for example, between them. Ex. 2007 at 45:5-51:14; Ex. 2005 at ¶¶ 70-76. In this disclosure, the general term “isolator” refers to a vibration isolator. Ex. 2005 at ¶ 71. For purposes of this proceeding, Patent Owner believes the terms “isolator,” “vibration isolator,” and even “vibration damper” are relatively synonymous. Further, for purposes of this proceeding, the isolators at issue are passive isolators as opposed to active isolators, or active dampers, which are more complex than passive isolators and are externally controlled, including elements like sensors, actuators, etc.

Passive vibration isolators are typically made of rubber or plastic. However, the term isolator does not necessarily connote a particular material type. Rather, the term isolator connotes a structure that is designed to isolate and in particular, here, to isolate for vibration. Ex. 2007 at 44:10-51:14; Ex. 2005 at ¶¶ 70-76.

The isolators of the '415 Patent exhibit spring and damping constants and are made of certain materials such that they are designed to minimize vibrations that

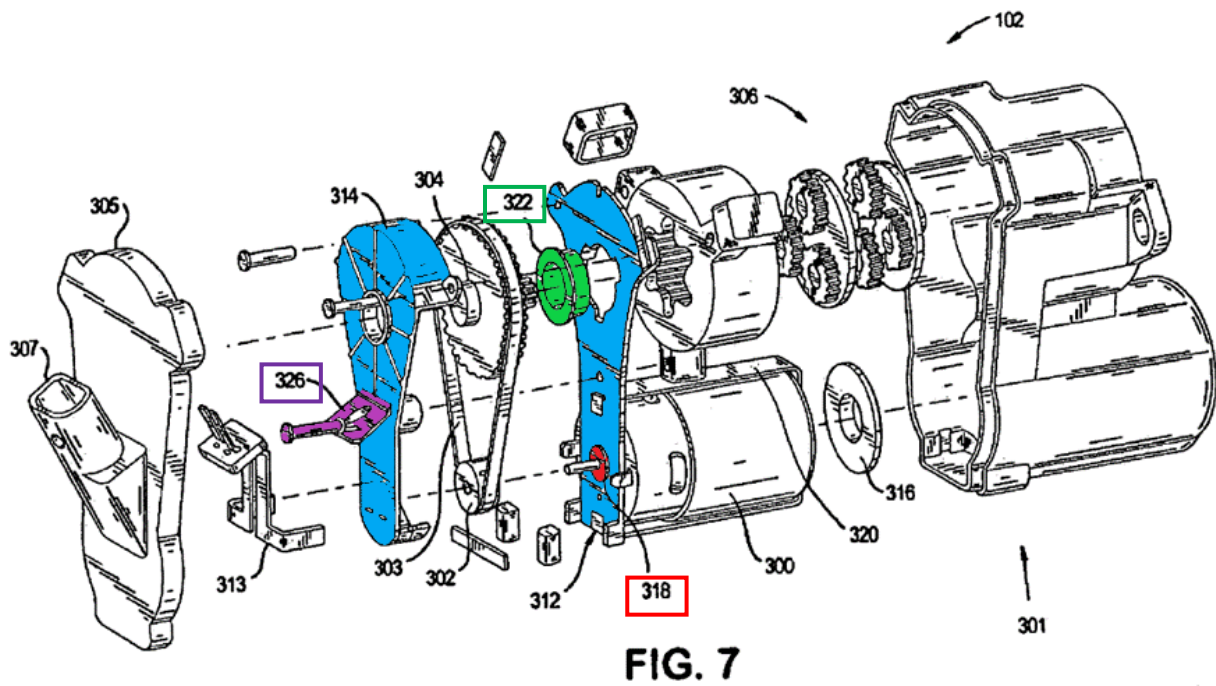
would be conducted between various components, thereby reducing the noise generated and/or transmitted between those components. Ex. 1001 at 1:56-67; 6:1-11. Specifically, the claims at issue in this case relate to isolators between the sub-frame and another component of the EPBA. The combination of the sub-frame and its associated isolators reduces noise and vibration by isolating the EPBA components from the structure to which the EPBA is mounted. *Id.* at 5:44-8:29.

Importantly, while EPBAs were known, and isolators were known in a general sense, the claimed relationships between isolators and a sub-frame were not.

The claims at issue in this case recite an isolator in one of three locations, as summarized in the below table:

Isolator location	Claim
Sub-frame/motor (red)	5, 14, 19, 24
Sub-frame/gear set (green)	7
Sub-frame/housing (purple)	8, 16, 17, 18, 25

Examples of these isolators are shown in Figure 7 as isolation bushing 318 (red), isolation bushing 322 (green), and isolator 326 (purple). *See* Figure 7 (annotated below). Other claims recite other isolators, such as claims 15 and 24 which additionally recite isolators coupled to the motor 300, such as isolation bushing 316 in Figure 7. The claims at issue in this matter, however, all recite at least one isolator mounted relative to a sub-frame.



1. Sub-frame/motor isolator

The isolators are placed in specific, designated locations. Some claims relate to an isolator coupled between a sub-frame and motor, such as isolation bushing 318 (red). The isolation bushing 318 is shown below in annotated Figure 7. The isolation bushing 318 is also modeled in the schematic of Figure 10.

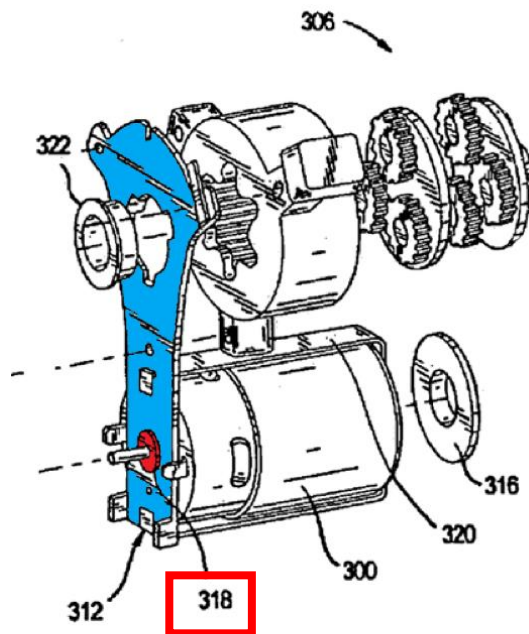


FIG. 7

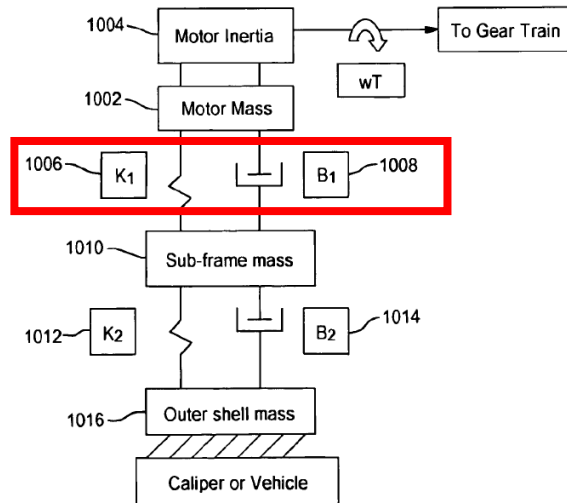


FIG. 10

As shown above, isolation bushing 318 is coupled between the motor 300 and the sub-frame lower portion 312 at an axial end of the motor 300. Ex. 1001 at 6:1-11. Isolation bushing 318 minimizes transmission of vibrations and noise from the motor 300 to the sub-frame and other actuator components. *Id.*

Independent claim 5 is an example sub-frame/motor claim and recites, in relevant part, “said actuator further comprising a component isolator having a spring constant and a damping constant, said isolator coupled between said motor and said sub-frame.” Claims 14 and 24 also relate to an isolator between a sub-frame and a motor, similar to claim 5.

2. Sub-frame/gear set isolator

One claim at issue in this matter relates to an isolator coupled between the sub-frame and a planetary gear set. Isolation bushing 322 is coupled between the sub-frame bottom portion 312 and the planetary gear set 306, which minimizes the transmission of noise and vibration between the planetary gear set 306 and the sub-frame bottom portion 312. Ex. 1001 at 6:59-7:3. Isolation bushing 322 is shown below in green in an annotated version of Figure 7.

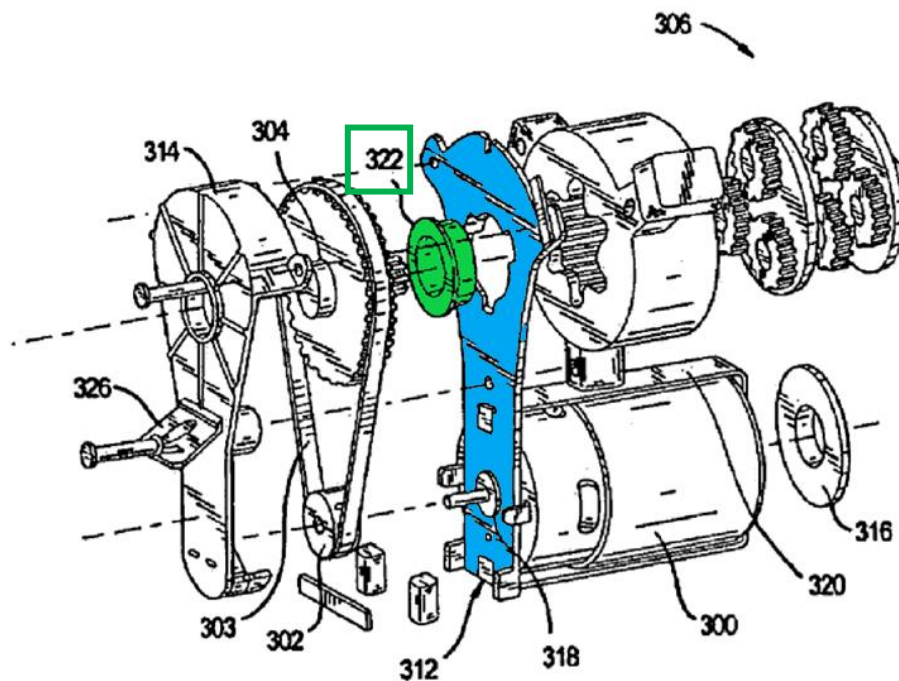


FIG. 7

Dependent claim 7, the sole sub-frame/gear set claim, recites “a component isolator having a spring constant and a damping constant, said isolator coupled between said at least one planetary gear set and said sub-frame.”

3. Sub-frame/housing isolator

Finally, other claims at issue in this matter relate to an isolator between the sub-frame and the actuator housing. An example is isolator 326. In the below embodiment, the isolator 326 (purple) is coupled between the sub-frame top portion 314 and the housing 305. *Id.* at 7:4-15. Isolator 326 is shown below in an annotated version of Figure 7 and is schematically represented in Figure 10.

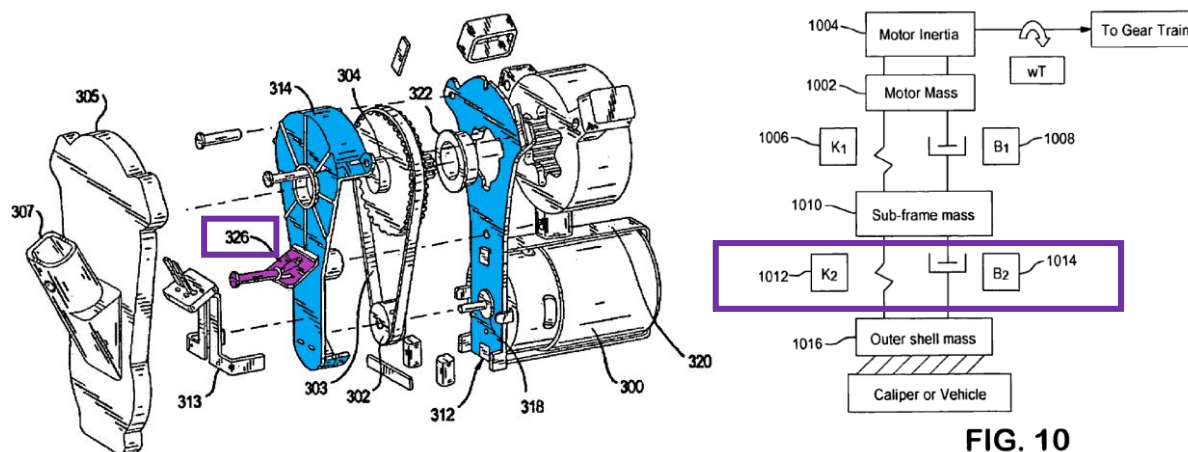


FIG. 10

Claim 16 is an exemplary sub-frame/housing claim, and recites in part “a sub-frame isolator having a spring constant and a damping constant, said isolator disposed between said sub-frame and an actuator housing.” Similar combinations are recited in claims 8, 17, and 25.

III. LEVEL OF ORDINARY SKILL

Patent Owner objects to the level of ordinary skill proposed by Petitioners. Petitioners’ proposal is:

A POSA at the time of the alleged invention would have had a bachelor's degree (or equivalent) in mechanical engineering, electrical engineering, automotive engineering, or a similar discipline, and at least two years of experience with electromechanical devices such as actuators.

See Petition at page 16. Petitioners include “electrical engineering” as a degree that a person of ordinary skill in the art could hold. The issues in this case do not relate to electronics or electricity. While the claims do recite a motor, this case does not relate to the contents or control of the motor itself.

Further, Petitioners believe a POSA should have at least two years of experience with electromechanical devices. The unrestricted reference to “electromechanical devices” covers too broad a swathe. According to Petitioners, one with an electrical engineering degree and two years of experience designing how current flows to motors would qualify as a POSA. Indeed, that is the precise area of expertise of Petitioners’ declarant Dr. Lequesne. Ex. 2007 at 10:6-32:5.

But Petitioners misapprehend the scope of the technology at issue. This case relates primarily to noise attenuation and vibration damping for actuators. Petitioners’ broad definition of the subject matter of this case appears to stretch the bounds of a POSA so their declarant fits within the definition.

Another problem Petitioners face is that their definition would exclude individuals that lack experience with electromechanical devices, but have significant

noise attenuation and vibration isolation experience. During his deposition, Dr. Lequesne admitted that the definition of a POSA should include those with more general vibration damping experience. Ex. 2007 at 54:14-55:9.

To address these issues, Patent Owner has modified Petitioners' proposal to remove electrical engineering as a relevant degree, and to tailor the area of requisite experience to noise attenuation and vibration damping. Patent Owner proposes the following definition of a person having ordinary skill in this art:

A POSA at the time of the invention would have had a bachelor's degree (or equivalent) in mechanical engineering, automotive engineering, or a similar discipline, and at least two years of experience with vibration isolation, vibration damping, or noise attenuation in the context of mechanical or electromechanical systems.

Patent Owner's declarant Dr. Stein qualifies as a POSA under either definition. Ex. 2005 at ¶¶ 52-58. Dr. Lequesne is not a POSA under Patent Owner's definition. Regardless of which definition the Board chooses to apply, Patent Owner maintains that Dr. Lequesne's testimony in this case should be weighted according to Dr. Lequesne's experience level with noise vibration and damping, which is minimal. See PTAB Consolidated Trial Practice Guide (Nov. 2019), page 34, available at <https://www.uspto.gov/TrialPracticeGuideConsolidated> ("The Board has broad discretion to assign weight to be accorded expert testimony.").

IV. CLAIM CONSTRUCTION

Consistent with the specification, a sub-frame is not an actuator housing, and an actuator housing is not a brake caliper. *In re Smith Int'l, Inc.*, 871 F.3d 1375, 1383-84 (Fed. Cir. 2017) (even under the broadest reasonable interpretation standard, a “body” was distinguishable from various other structures based on the descriptions of the same in the specification). This is significant because Petitioners fail to appreciate the distinctness of these terms.

A. Sub-frame

A “sub-frame” is “a frame for a sub-assembly,” which has a particular meaning in the context of the '415 Patent. Ex. 2005 at ¶¶ 59-63. For one, the sub-frame is distinct from the actuator housing, which is an outer casing of the actuator. *Id.*

The specification consistently refers to the sub-frame as being distinct from the actuator housing. For example, the sub-frame is described as a frame that permits one to mount the motor 300 and gear train to the sub-frame 312 “outside of the actuator housing 301,” which provides for “greater access” to the motor and gear train and improved “handling.” Ex. 1001 at 4:44-54. Further, the sub-frame and actuator housing are also disclosed as cooperating to define a motor cavity. *Id.* at 6:36-54. While the two structures cooperate with one another, they are not provided by a common structure—that is, they are not one and the same.

The claims themselves use the term “sub-frame” distinct from “actuator housing.” For instance, claims 13, 16, 17, and 20 each recite both a “sub-frame” and an “actuator housing.” Some claims even recite a vibration isolator between the sub-frame and the actuator housing, such as claim 25 which recites “providing at least one isolation bushing between said portion of said actuator housing and said sub-frame.” One would not be able to provide an isolation bushing between a sub-frame and an actuator housing, as recited in claim 25, if the components were not separate. *CAE Screenplates, Inc. v. Heinrich Fiedler GmbH & Co. KG*, 224 F.3d 1308, 1317 (Fed. Cir. 2000) (“In the absence of any evidence to the contrary, we must presume that the use of these different terms in the claims connotes different meanings.”) (citations omitted).

Petitioners themselves acknowledge a sub-frame is distinct from an actuator housing when stating that attaching “mechanical components (the motor, gears, etc.)” to “a sub-frame[] essentially form[s] a module that is then placed in a housing.” Petition at 1.

In light of the above, one would deem a sub-frame to be a frame for a sub-assembly that is distinct from an actuator housing. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (“Importantly, the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which

the disputed term appears, but in the context of the entire patent, including the specification.”); *In re Smith*, 871 F.3d at 1383-84.

While some claims do not recite both an “actuator housing” and a “sub-frame,” the terms should be interpreted consistently in all claims. The general rule is that like claim terms within the same patent are to be construed in the same manner. *Rexnord Corp. v. Laitram Corp.*, 274 F.3d 1336, 1342 (Fed. Cir. 2001). This is not a case where there are multiple disclosed embodiments, and the patent includes different claim sets, each using the same claim term in a completely different context. *Haemonetics Corp. v. Baxter Healthcare Corp.*, 607 F.3d 776, 782 (Fed. Cir. 2010). Rather, the specification consistently refers to “sub-frames” as being distinct from an “actuator housing,” listing several benefits associated with their distinctness. Accordingly, the term “sub-frame” should be construed the same in all claims.

Finally, Patent Owner never took the position or made arguments during prosecution that would render a “sub-frame” broad enough to be deemed an equivalent structure to an “actuator housing.” *See, e.g.*, Ex. 1004 at 130 (March 16, 2005 Remarks) (explaining that “the housing and the sub-frame work together to separate the motor from the remainder of the actuator, i.e., at least the gear train.”).

B. Actuator housing

Patent Owner proposes construing the term “actuator housing” as “an outer casing of the actuator.” Ex. 2005 at ¶¶ 64-67. Specifically, the term “actuator housing” should not be construed to cover a brake caliper, because the specification consistently refers to actuator housings as structures that are distinct from brake calipers, and because at least some claims use the terms separately to refer to different structures. *Id.*

The '415 Patent uses the terms “actuator housing” and “brake caliper” to refer to different structures. The term “actuator housing” is used to refer to the housing 301 of actuator 102. See Ex. 1001 at 4:7-21. The '415 Patent describes the actuator 102 as a structure that is attachable to the caliper 106. See *Id.* at 3:1-9; see also Figures 1, 3, and 4 (annotated below).

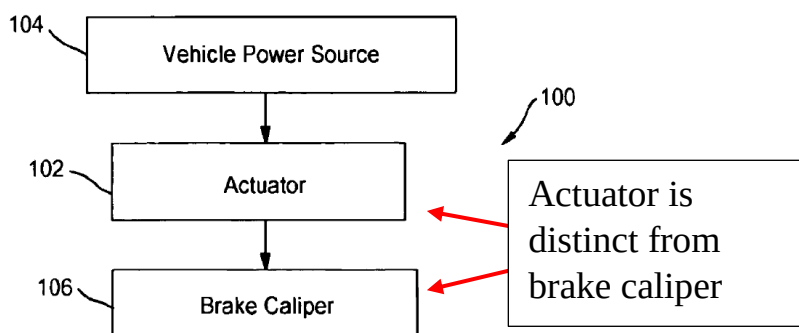
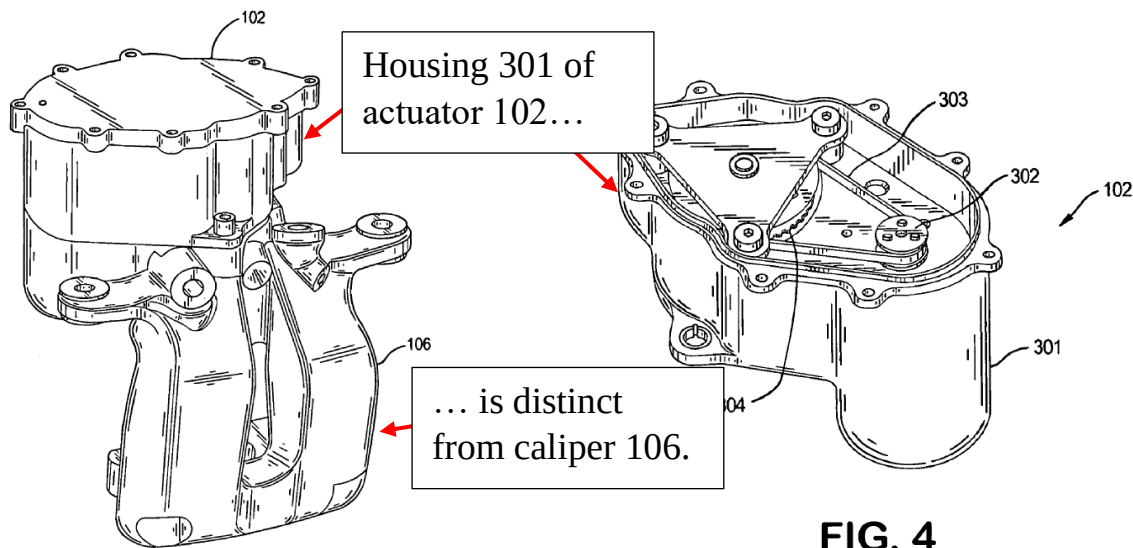


FIG. 1



The term “actuator housing” is never used to refer to a brake caliper or a portion of a brake caliper. Patent Owner is not seeking to import limitations from the specification into the claims—rather, Patent Owner only references the specification to highlight the distinction between an actuator housing and a caliper. *Phillips*, 415 F.3d at 1313; *In re Smith*, 871 F.3d at 1383-84 (a “body” was distinguishable from various other structures based on the descriptions of the same in the specification).

Many claims in the ’415 Patent recite both an “actuator housing” and a “brake caliper.” See, e.g., Ex. 1001 at claim 17 (reciting both an “actuator housing” and a “brake caliper”). Again, different claim terms are presumed to have different meanings. *CAE Screenplates, Inc.*, 224 F.3d at 1317. In light of the different claim

terms, coupled with the remainder of the disclosure, it is improper to read an “actuator housing” on a “brake caliper.”

While some claims do not recite both an “actuator housing” and a “brake caliper,” all claim terms within the patent should be interpreted consistently. Again, this is not a case, as in *Haemonetics* (cited *supra*), where an exception to this general rule applies. All disclosed embodiments of the ’415 Patent consistently refer to “actuator housings” as being distinct from “brake calipers.” Accordingly, the term “actuator housing” should be construed the same in all claims as an outer casing for an actuator and as a distinct structure from a brake caliper.

In the Institution Decision, the Board faulted Patent Owner for failing to provide a “lexicographic definition or disclaimer sufficient to limit the claim term ‘actuator housing’ to a structure separate from a brake caliper.” Institution Decision (Paper 9) at pages 36-37. The Federal Circuit, in *Smith*, clarified that this is not the appropriate analysis. *In re Smith*, 871 F.3d at 1383 (Stating it was improper for the Board to emphasize “that the patentee here did not act as a lexicographer, and that the specification neither defines nor precludes the examiner’s reading of the term ‘body.’”). The relevant question is whether the ordinary meaning of “actuator housing” in the context of the specification, as interpreted by a POSA, would read on a brake caliper. The answer is no.

V. NON-OBVIOUSNESS OF CHALLENGED CLAIMS

Once the pertinent terms have been construed, comparing the prior art with the claims demonstrates that Petitioners have failed to meet its burden of proving obviousness.

Patent Owner will show that the claims are patentable over any evidence presented by Petitioners. There are three main reasons:

- 1) Nowhere on this record do Petitioners or Dr. Lequesne allege there is any vibration at the locations where they propose to add isolators, let alone vibration that requires damping. The statements could be summarized as “if there were vibration there, one might put an isolator there.” This is not sufficient motivation to add an isolator.
- 2) As set forth below, Poertzgen and Weiler (the base references for all grounds) are precision actuators and their operation would actually be inhibited by the addition of isolators.
- 3) The precision movement contemplated in both Poertzgen and Weiler would be further frustrated by the proposed combinations to meet claims 15, 19 and 24 which require plural isolators.

A. Ground 1 – Poertzgen in view of Boucheret does not support obviousness of claims 5, 7, 8, or 14-19

In this ground, Petitioners propose modifying Poertzgen, a precision positioning actuator that itself lacks isolators, to include isolators in the particularly-claimed locations, as allegedly taught by the fan motor of Boucheret. Petition at 40-52. The main problem with this approach is that Petitioners wish to marry a precision actuator with a non-precise fan motor.

1. Poertzgen

Poertzgen (Exs. 1007, 1008) discloses a hydraulic service brake which is usable as a parking brake when selectively driven by motor 42, shown below in annotated Figure 1. Poertzgen is a precision actuator. As explained by Dr. Stein, Poertzgen's system is concerned with providing an actuator that provides a desired level of clamping force relative to a brake rotor in a short period of time. Ex. 2005 at ¶¶ 78-88. Poertzgen does not disclose any isolators in its system, let alone isolators mounted relative to its motor 42 or its reduction gear 44. Further, Poertzgen does not use the term frame or sub-frame in its disclosure. Petitioners apparently believe the structure to the immediate right-hand side of Poertzgen's motor 42, as depicted below, is a sub-frame. Patent Owner disputes that this is a sub-frame. Patent Owner also disputes Petitioners' position that one would have added the claimed isolators into Poertzgen.

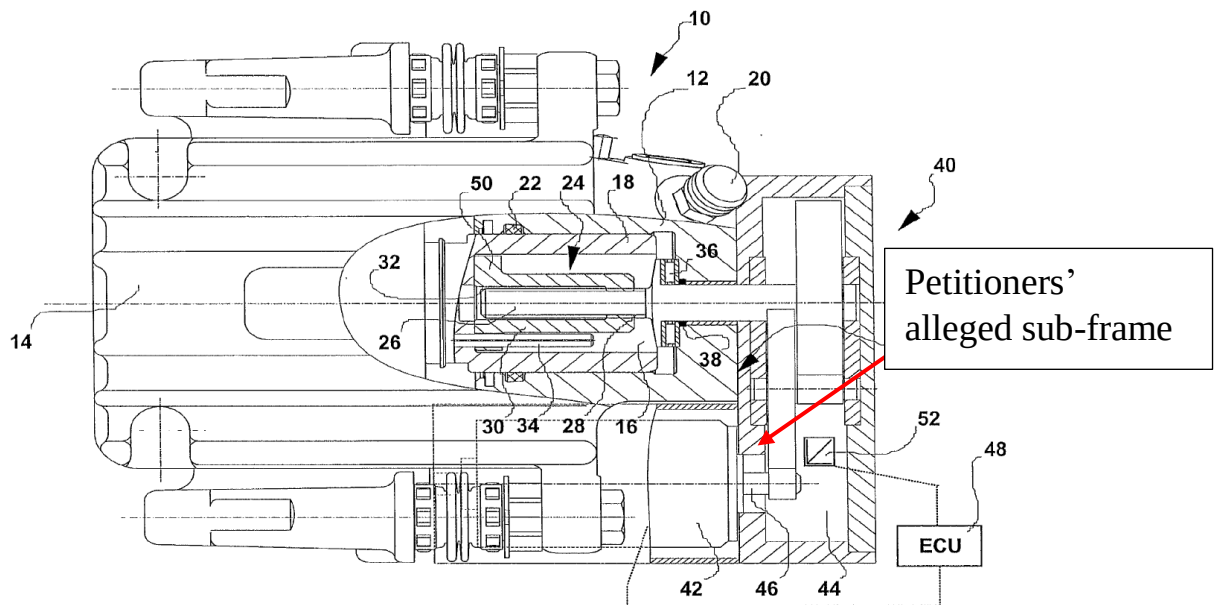


Fig. 1

With reference to Figure 1 above, Poertzgen discloses an actuator including a motor 42 configured to drive a reduction gear 44, which is in turn configured to drive a spindle 26, which translates a nut 30, which finally translates a brake piston 18 into engagement with a rotor. Poertzgen has two main design goals. First, Poertzgen desires its system to achieve a maximum clamping force in a short time, such as within about 1 second. Ex. 1007 at 3:17-34. Second, Poertzgen does not want its brake piston to contact the nut prematurely after actuation. *Id.* Thus, when its actuator is not activated, Poertzgen desires to maintain a constant distance of about 0.5 mm between its nut 30 and brake piston 18. *Id.* at 9:3-10.

In order to maintain this 0.5 mm spacing between nut 30 and piston 18, Poertzgen describes a number of sensors that can be used to determine the position

of the nut 30. Critically, Poertzgen relies on sensed motor rotations to deduce whether the nut 30 has returned to the desired 0.5 mm spacing after release of its parking brake. Ex. 1007 at 10:8-20. Poertzgen is able to deduce nut position “[b]ecause of the known reduction ratio between the output shaft 46 of the electric motor and the spindle 26.” *Id.* Specifically, because the reduction ratio is known, Poertzgen states that the spacing between the nut 30 and piston 18 can be adjusted “very precisely” simply by counting a number of revolutions of the output shaft. *Id.*

However, if one introduced isolators between Poertzgen’s otherwise rigidly-mounted components, one would introduce adverse motion and misalignments into Poertzgen’s device, and Poertzgen could no longer reliably deduce a precise nut position using sensed motor rotation. Ex. 2005 at ¶ 81. Doing so would also introduce softness into Poertzgen’s hard-mounted system, which would lead to a delay in Poertzgen reaching its maximum clamping force. *Id.* at ¶ 82.

For at least these reasons, Poertzgen would not benefit from the addition of vibration isolators. Indeed, the contrary. Introducing vibration isolators into Poertzgen could cause unwanted motion or misalignments of the components in Poertzgen’s system, leading to performance issues, among other potential problems.

2. Boucheret

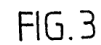
Petitioners primarily rely on Boucheret as evidence that one would have modified Poertzgen to include the claimed isolators.

While Poertzgen discloses an electric parking brake actuator (EPBA), Boucheret (Ex. 1010) does not. Boucheret instead relates to a motor for a fan unit. Ex. 1010 at 1:7; 3:6. Boucheret's motor is not used in a precision positioning system, such as that of Poertzgen. Ex. 2005 at ¶¶ 89-98. Rather, Boucheret's motor is coupled to a fan of an HVAC unit. Fans are not precision positioning devices. *Id.* Rather, the output of Boucheret's motor is simply configured to rotate a fan. Boucheret is the type of system that can accommodate loose tolerances between components. *Id.* at ¶ 69. Indeed, Boucheret specifically states that a benefit of its disclosure is that it accommodates components that exceed designed "tolerances." *See* Ex. 1010 at 1:65-2:3; 2:26-34. Deviation from designed tolerances is not a concern for Boucheret. So, Boucheret is the type of motor that can readily benefit from the introduction of vibration dampers. Ex. 2005 at ¶¶ 89-98.

Further, unlike Poertzgen, fan motors like Boucheret are designed to be run for extended periods. *Id.* ¶¶ 96-98. Thus, Boucheret achieves a steady operational state. *Id.* at ¶ 97. As explained by Dr. Stein, Boucheret's motor will settle into a stable speed and produce vibrations exhibiting stable amplitudes at a consistent frequency. *Id.* On the other hand, Poertzgen's actuator is configured to run for about 1 second at a time, exhibits variable speeds during this short time, and will exhibit a complex vibration signature with many frequencies of varying amplitudes. *Id.*

Beyond this, Boucheret relates to a specific type of motor with “radial fastening lugs” integrated into the motor. Ex. 1010 at 1:10-18. Boucheret characterizes its disclosure as an improvement over another radially-mounted motor from FR 2 693 779 to Ralf-Michael (Ex. 2002, 2003). *Id.* The annotated Figures below, from Boucheret and Ralf-Michael, show that these two references apply to motors with several radially-projecting lugs arranged around an outer circumference of the motor.

Both motors are mounted to a housing via the lugs. In the left-hand image below, Ralf-Michael’s motor 10 has radial ribs 11 for mounting to a housing 20, 21. Damping elements 12 are provided between the ribs 11 and Ralf-Michael’s housing 20. In the right-hand image, below, Boucheret likewise discloses a motor 6 with radial lugs 13, which are again used to mount the motor 6 to a housing 1 via damping elements 15.



According to Boucheret, the dampers of Ralf-Michael cannot adequately absorb axial vibrations. Ex. 1010 at 1:18-29. Boucheret seeks to improve on this aspect of Ralf-Michael by providing its damping elements 15 with grooves on all outer faces, which, according to Boucheret, makes it possible “to absorb the axial, radial and tangential vibrations and their combinations.” *Id.* at 1:65-2:3. Example grooves 30, 31, and 32 are visible in Boucheret’s annotated Figure 4, below.



Boucheret does not include isolators at the axial ends of motor 6 (the flat ends of the cylinder), which is one of the locations corresponding to where Petitioners seek to add isolators to Poertzgen and Weiler. *See* Boucheret's Figure 2, annotated below.

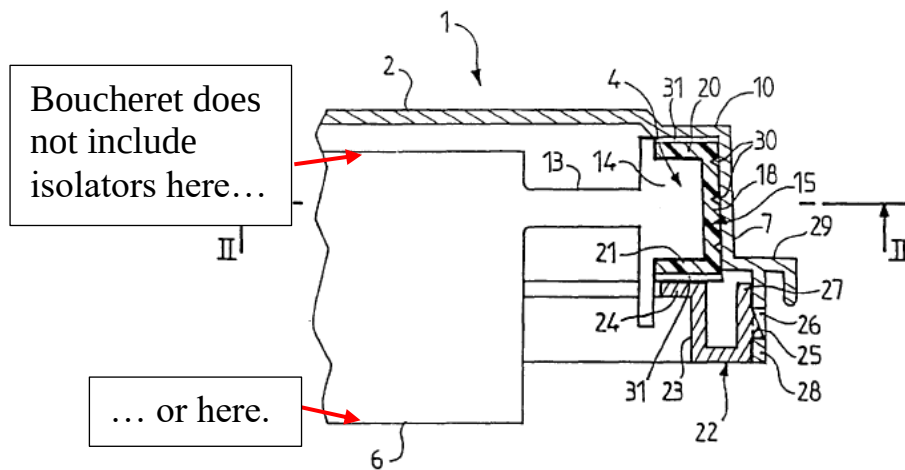


FIG. 2

Boucheret's grooved dampers are able to absorb axial, radial, and tangential vibrations, despite Boucheret's dampers being provided only at a radially-outward location relative to Boucheret's motor 6.

3. Claim 5 is not obvious over Poertzgen and Boucheret—No Motivation

Claim 5 recites, in relevant part, “a sub-frame, said motor being mounted on said sub-frame, said actuator further comprising a component isolator having a spring constant and a damping constant, said isolator coupled between said motor

and said sub-frame.” Again, an example of such an isolator is isolation bushing 318 (red, above) in Figure 7.

According to Petitioners, it would have been obvious to add an isolator between the motor of Poertzgen and the structure in Poertzgen that Petitioners have identified as a sub-frame, in view of Boucheret.

Petitioners’ stated motivation is: “when NVH needs to be reduced, it is standard engineering practice, obvious to a POSA, to analyze the design for vibration/noise transmission paths and place isolators in those paths.” See Petition at 41. Petitioners’ motivation is conditioned on a POSA taking action “when NVH needs to be reduced.” Petition at 41. However, Petitioners never allege that Poertzgen needs a reduction in NVH. Petitioners do not even follow the chain of logic required by their own statement of motivation. *In re Anova Hearing Labs, Inc.*, 809 F. App’x 840, 843 (Fed. Cir. 2020) (nonprecedential) (vacating and remanding the Board’s obviousness decision for lack of motivation in part because “[t]he Board does not explain why a person of skill in the art would conclude that [the base reference] needed to be modified.”).

Again, the motivation to add an isolator cannot be supplied by the ’415 Patent, especially given the actual differences between the EPBA of the ’415 Patent and that of Poertzgen.

Petitioners also condition their motivation on a POSA performing a hypothetical analysis that would apparently indicate Poertzgen needs an isolator in a particular location. However, Dr. Lequesne admitted that he did not do any modeling, testing, or similar type of analysis in this case. Ex. 2007 at 62:11-13. Petitioners never allege that if a POSA analyzed Poertzgen, that the analysis would have indicated that an isolator would be needed between a motor and a sub-frame. Petitioners' own motivation is based on completely circular logic that Petitioners have not even attempted to follow. *PersonalWeb Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 993-994 (Fed. Cir. 2017) ("But that reasoning seems to say no more than that a skilled artisan, once presented with the two references, would have understood that they could be combined. And that is not enough: it does not imply a motivation to pick out those two references and combine them to arrive at the claimed invention."). In other words, Petitioners are guessing that Poertzgen might need an isolator in a particular spot.

In reality, one would not have introduced the claimed isolator into Poertzgen. The actuator of Poertzgen is of the type that prioritizes precision, and relies on tight tolerances between adjacent mechanical components. As explained by Dr. Stein, isolators can reduce vibrations when used properly in certain systems, but isolators can also lead to the creation of undesired motions and misalignments between

adjacent mechanical components, which can actually make such systems worse and even lead to vibrations. Ex. 2005 at ¶¶ 78-88; 114-125.

Using isolators in Poertzgen, for example, would make it difficult if not impossible for Poertzgen to reliably determine the precise relationship between its nut and brake piston. *Id.* at ¶¶ 81-88, 116. Again, Poertzgen’s main disclosed technique for determining the distance between its nut and brake piston is to deduce nut movement based on sensed motor rotations, and that deduction would be unreliable if isolators were present. *Id.* Petitioners do not acknowledge or address the fact that introducing an isolator into the Poertzgen system could make Poertzgen’s system worse in these respects. *Id.* Petitioners effectively take a one-sided view that isolators can be used anywhere, in any type of system, and those isolators will always reduce vibrations without any potential downsides. *Merck Sharp & Dohme Corp. v. Wyeth LLC*, 792 F. App’x 813, 818 (Fed. Cir. 2019) (nonprecedential) (vacating and remanding the Board’s decision as “too cryptic” when the parties in an IPR disputed a number of factual issues and “the Board simply did not address the evidence as to whether someone skilled in the art would have been motivated to combine” or whether “the potential loss of [a certain characteristic] would have dissuaded someone skilled in the art from making such a combination.”).

While Poertzgen and Boucheret both disclose motors, their similarities stop there. Petitioners have fallen into a “hindsight trap” and unfairly discounted Patent Owner’s invention as technologically simple and improperly relied on “prior art statements that in the abstract appear[] to suggest the claimed limitation.” *In re Kotzab*, 217 F.3d 1365, 1371 (Fed. Cir. 2000) (reversing the Board when the Board did not make a “finding as to the specific understanding or principle within the knowledge of a skilled artisan that would have motivated one with no knowledge of [the] invention to make the combination in the manner claimed.”). When one looks at the actual evidence, the differences between Poertzgen and Boucheret are vast. Poertzgen’s actuator is configured to run in short bursts, for periods of about 1 second, at variable speeds to provide high clamping forces. Poertzgen seeks to achieve a precise spacing between two components of its system by deducing position based on motor rotations because of the known correlation of the component parts, which are hard-mounted according to tight tolerances and without isolators. Boucheret, on the other hand, is not concerned with deducing position, runs for extended periods at constant speeds, and can accommodate loose tolerances. Boucheret is not concerned with the problems Poertzgen is solving, and vice versa. Given the significant differences between the two systems, Boucheret’s vibration dampers would not even necessarily work as dampers when introduced into

Poertzgen. In this regard, Dr. Lequesne admitted during his deposition that one system's dampers would not necessarily be usable as dampers in a different system. Ex. 2007 at 63:16-64:11. Again, while Poertzgen and Boucheret are both actuators and both disclose motors, the differences between the two references outweigh any similarities. *Chemours Co. FC, LLC v. Daikin Indus.*, 4 F.4th 1370, 1376 (Fed. Cir. 2021) (reversing obviousness determination for failure to articulate a proper motivation when the Board "relied on teachings from other references that were not concerned with the particular problems [the base reference] sought to solve."); *In re NuVasive, Inc.*, 842 F.3d 1376, 1384 (Fed. Cir. 2016) (vacating and remanding obviousness determination when, *inter alia*, the Board never articulated why its stated motivation "would benefit a PHOSITA."); *See ActiveVideo Networks, Inc. v. Verizon Communs., Inc.*, 694 F.3d 1312, 1328 (Fed. Cir. 2012) (affirming JMOL of non-obviousness when proffered evidence was generic and otherwise "fail[ed] to explain why a person of ordinary skill in the art would have combined elements from specific references in the way the claimed invention does"); *TQ Delta, LLC v. Cisco Sys.*, 942 F.3d 1352, 1361-62 (Fed. Cir. 2019) (reversing the Board's obviousness determination based on a lack of motivation when the alleged supporting evidence amounted to a "brief, high-level explanation" of how the proposed modification

would benefit the base reference, but in reality there was no evidence supporting that explanation other than the disclosure of the patents-in-suit).

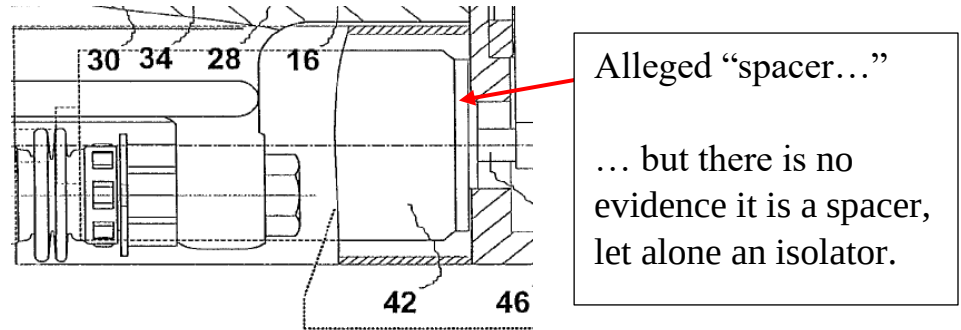
At best, Petitioners have established that one could make the claimed invention, but Petitioners have not demonstrated that one would have any reason to have done so. For at least the above reasons, there is no rational reason or motivation supporting the rejection. *See KSR*, 550 U.S. 398, 418 (2007) (“there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”) (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)); *see also InTouch Techs., Inc. v. VGO Commc’ns, Inc.*, 751 F.3d 1327, 1352 (Fed. Cir. 2014) (“Dr. Yanco’s testimony primarily consisted of conclusory references to her belief that one of ordinary skill in the art could combine these references, not that they would have been motivated to do so.”).

It seems Petitioners have drifted too far from the question of whether one would have found it obvious to add an isolator into Poertzgen. One cannot look to the ’415 Patent to answer the question of whether one would have added an isolator to Poertzgen. *See W.L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1552-53 (Fed. Cir. 1983) (using the claims “as a frame,” and taking the “naked parts of separate prior art references [] as a mosaic to recreate a facsimile of the claimed

invention” without a finding of why ordinary artisans would have found that mosaic obvious, improperly employs hindsight bias).

Seemingly in an effort to distance themselves from the teachings of Boucheret, Petitioners also cite to a portion of a book (Ex. 1014), along with Dr. Lequesne’s interpretation of this book, as evidence that one would have added the claimed isolator between Poertzgen’s motor and the alleged sub-frame of Poertzgen. Ex. 1002 at ¶ 181. The cited portions of Ex. 1014 do not relate to braking systems. As noted by Dr. Stein, Ex. 1014 does not discuss short-burst actuators or precision positioning actuators (like Poertzgen) at all. Ex. 2005 at ¶¶ 122, 123. The book of Ex. 1014 describes two use-cases where dampers are used to damp vibrations in continuously-running, steady-state systems. *Id.* Thus, Ex. 1014 teaches one to use dampers in systems similar to Boucheret’s, as opposed to actuators like those of Poertzgen. *Id.* In summary, Ex. 1014 would simply not lead one to introduce isolators into the precision positioning device of Poertzgen. *Id.*

Outside of Boucheret and the partial book of Ex. 1014, Petitioners attempt to support this ground by referencing an alleged “spacer” in Poertzgen. In particular, Petitioners believe a spacer is present between Poertzgen’s motor and the alleged sub-frame. See Petition at 35, 38; Figure 1 of Poertzgen (portion of which is annotated below).



Petitioners correctly admit that “Poertzen does not explicitly describe this as an isolator.” See Petition at 35. However, Petitioners do not even have a basis for referring to this structure as a “spacer.” The above rectangular-shape could be an end section or end cap of the motor as opposed to a spacer (let alone an isolator). Despite admitting that the above-structure is not disclosed to be an isolator, and with no evidence proving the structure is even a spacer, Petitioners claim that “the fact that Figure 1 already shows a spacer between the motor and the rest of the actuator” demonstrates why one would be motivated to make their proposed modification. See *Id.* at 38. This aspect of the Petitioners’ motivation to combine is wholly unsupported and should be ignored. Dr. Stein confirms that the alleged “spacer” is not disclosed to be an isolator. Ex. 2005 at ¶¶ 124-125.

Further, Petitioners set forth a “use of a known technique... to improve a similar device” rationale. See Petition at 37. This rationale requires “a finding that the prior art contained a ‘comparable’ device (method, or product that is not the same as the base device) that has been improved in the same way as the claimed

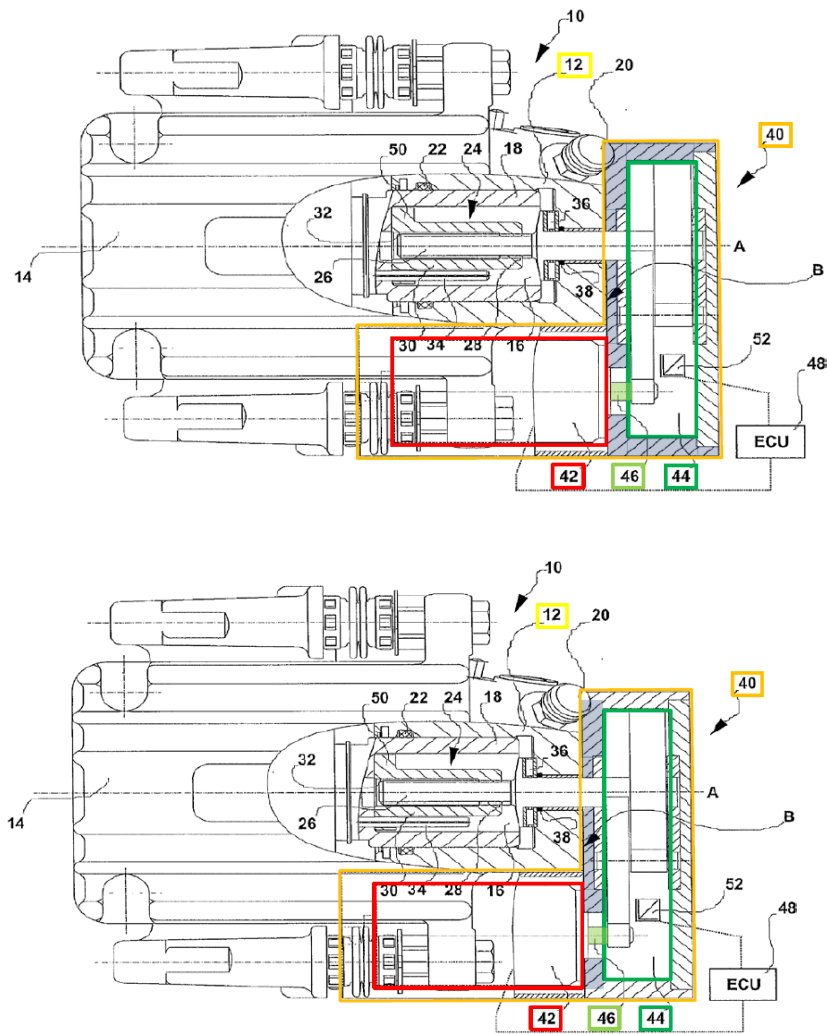
invention.” See MPEP § 2143(I)(C). Petitioners allege the “comparable” device is Boucheret, but Boucheret is not a comparable device for the reasons set forth above, and regardless, one would not have introduced an isolator into Poertzgen’s precision positioning system for the reasons stated above.

Petitioners’ rationale of combining “prior art elements (the isolator of Boucheret and the components of Poertzgen) according to known methods” likewise fails because that rationale requires finding “the prior art included each element claimed” and that one “could have combined the elements as claimed by known methods.” See Petition at 37; MPEP § 2143(I)(A). Again, the prior art does not teach a method for introducing vibration isolators into a precision actuator like Poertzgen.

To summarize, not only does Boucheret fail to support Petitioners’ proposed ground, but Petitioners have either ignored or did not appreciate that isolators could have disadvantages when used in Poertzgen. Petitioners have failed to set forth a proper motivation.

4. Claim 5—No sub-frame

Claim 5 is also non-obvious because Poertzgen lacks a “sub-frame” that is distinct from an actuator housing. Ex. 2005 at ¶¶ 126, 127. Petitioners believe the yellow region below is an “actuator housing” and that one of the below grey portions is a “sub-frame.” See Petition at 24, 25.



However, in both instances, the alleged sub-frame (Petitioners have colored the alleged sub-frames grey) is just a portion of the alleged actuator housing (Petitioners have colored it yellow). While Poertzgen generally relates to an actuator that is attachable to a brake caliper, the disclosed and claimed sub-frame permits a user to independently mount and test a sub-assembly of the actuator before final assembly of the actuator. For this functionality to be realized, the sub-frame must be a separate structure from the actuator housing. The added functionality provided by

the claimed sub-frame is not contemplated by the above grey structures, because, in reality, they are merely portions of an actuator housing. Accordingly, there is no *prima facie* case of obviousness because Poertzgen lacks a “sub-frame.”

5. Claim 7 is not obvious over Poertzgen and Boucheret

Claim 7 recites “a component isolator having a spring constant and a damping constant, said isolator coupled between said at least one planetary gear set and said sub-frame.” An example is the green isolation bushing 322, above.

As noted, Poertzgen does not disclose isolators at all, and Boucheret merely teaches one to provide dampers radially outward of a motor, surrounding lugs that project from a motor. Neither reference teaches an isolator mounted to a gear set or a sub-frame, let alone both, as required by the claims. One would not couple an isolator between a sub-frame and planetary gear set in light of Poertzgen (no isolators) and Boucheret (isolator mounted relative to motor). The logical leaps and hand-waving Petitioners go through in an effort to reach claim 7 is divorced from the evidence in the record.

Further, beyond this, there is still no reason to introduce the claimed isolator into Poertzgen for essentially the same reasons articulated above relative to claim 5. Ex. 2005 at ¶¶ 128, 129. Poertzgen is a tightly-controlled system and Petitioners have not addressed whether, or how, isolators could be introduced into that system without introducing unwanted motion and misalignments into Poertzgen’s system.

Id. Boucheret certainly does not provide an answer, for the above reasons and also because Boucheret teaches nothing related to mounting a sub-frame and a gear set relative to one another via an isolator.

Petitioners have also not identified a sub-frame in Poertzgen.

Again, Petitioners do not even allege there was any vibration at any of the locations in Poertzgen.

There is no *prima facie* case of obviousness for claim 7.

6. Claim 8 is not obvious over Poertzgen and Boucheret

Claim 8 recites “said actuator further comprising a sub-frame isolator having a spring constant and a damping constant, said isolator coupled between said sub-frame and a remainder of said actuator.” An example is purple isolator 326, above.

Again, Poertzgen does not disclose isolators at all, and Boucheret merely teaches one to provide dampers radially-outward of a motor, surrounding lugs that project from a motor. Neither reference teaches one to mount an isolator to a sub-frame at all, let alone between a sub-frame and a remainder of an actuator. Further, Poertzgen lacks a sub-frame. For essentially the same reasons discussed above, there is no *prima facie* case of obviousness of claim 8. Ex. 2005 at ¶¶ 130, 131.

7. Claims 14 and 15 are not obvious over Poertzgen and Boucheret

Claim 14 recites an isolator disposed “between said sub-frame and said motor,” similar to claim 5, and is non-obvious for the same reasons as claim 5. Claim 15 depends from claim 14 and is non-obvious for the same reasons as claim 14.

In addition, claim 15 depends from claim 14 and recites “a second motor isolator.” As to claim 15, once one adds a second isolator the problems identified by Dr. Stein of deterioration of the precision movement of the components would only be further increased. Ex. 2005 at ¶¶ 132-134; 138, 139. Petitioners argue for especially problematic combinations without any support, introducing additional uncertainty as to the result.

In the Petition, at page 46, Petitioners attempt to support its argument by the statement “repeating a known element is obvious.” First, claim 15 is not “repeating” any element. It is placing an isolator at a position not required by the upstream claim. Moreover, there is absolutely no support, neither evidence nor legal precedent, to buttress Petitioners’ argument. Further, because Boucheret teaches one to absorb all vibrations from a common location, Boucheret would not lead one to add multiple isolators in different locations, as in claim 15. Ex. 2005 at ¶ 134.

8. Claim 16 is not obvious over Poertzgen and Boucheret

Claim 16 recites “a component isolator having a spring constant and a damping constant disposed between said sub-frame and an actuator housing.” An example is purple isolator 326. Whereas Boucheret teaches one to mount a damper radially outward of a motor, surrounding lugs that project from a motor, this teaching would not lead one to add an isolator between a sub-frame and an actuator housing, as claimed. For essentially the same reasons set forth above with respect to claim 8, there is no *prima facie* case of obviousness relative to claim 16. Ex. 2005 at ¶¶ 135, 136. Further, claim 16 recites both an “actuator housing” and a “sub-frame.” The above argument regarding Poertzgen’s lack of a sub-frame is perhaps most evident in the context of claim 16. It is improper for Petitioners to read a “sub-frame” on a portion of an “actuator housing” in all claims, but undeniably so in claim 16. Claim 16 uses different terms to refer to distinct structures, and Petitioners have not appreciated the claimed delineation.

9. Claims 17 is not obvious over Poertzgen and Boucheret

Claim 17 recites “a component isolator having a spring constant and a damping constant disposed between said sub-frame and an actuator housing.” As noted relative to claims 8 and 16, this combination of features is not obvious over Poertzgen in view of Boucheret. Ex. 2005 at ¶ 137.

Further, claim 17 recites both an “actuator housing” and a “sub-frame” which underscores that these are separate, distinct structures, and Petitioners have not appreciated the claimed distinction.

10. Claims 18 and 19 are non-obvious

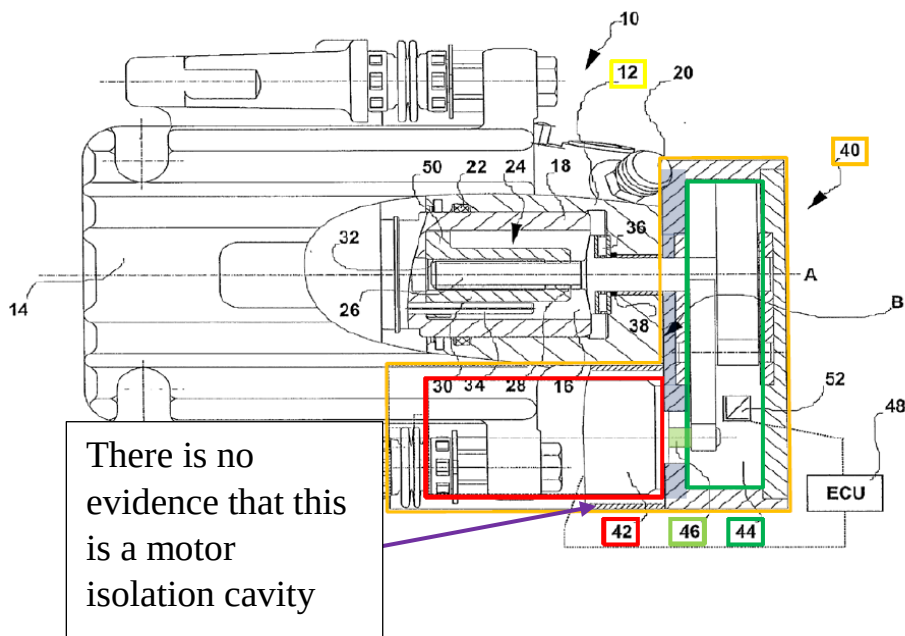
Claims 18 and 19 are non-obvious at least because they depend from claim 17. But additionally, claim 19 introduces an additional isolator. Claim 19 recites “a motor isolator having a spring constant and a damping constant, said motor isolator disposed between said motor and said mounted plate.” The “mounted plate” is a typographical error that refers to the “sub-frame” of claim 17. Even Petitioners equate the two terms. *See* Petition at 52.

So, in claim 19, there must be an isolator between the sub-frame and the actuator housing, and another isolator between the motor and the sub-frame. Petitioners’ alleged basis for obviousness of claim 19 is effectively that, again, based on Boucheret, one could essentially place multiple isolators within the device of Poertzgen and reach the claims. However, Boucheret teaches dampers that absorb all vibrations from a common, radially-outer location. Boucheret would not lead one to place isolators in different locations within an actuator. Ex. 2005 at ¶¶ 138, 139. Petitioners do not address this discrepancy between Boucheret’s teachings and the language of claim 19. Petitioners have therefore failed to consider the scope and content of the prior art and have also failed to appreciate the differences between the

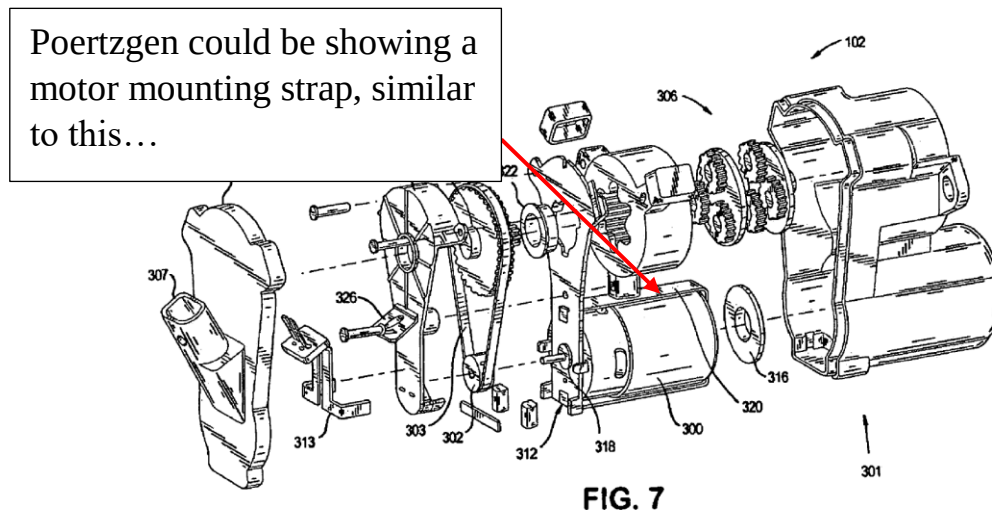
claims and the content of the prior art, violating *Graham* and *KSR* (and their progeny). *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007); *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

Again, as to claim 19, a plurality of isolators would only provide that much more of a challenge to achieving the precision movement that Poertzgen requires. Ex. 2005 at ¶ 139. Without support or reason Petitioners ask the Board to support adding isolators everywhere.

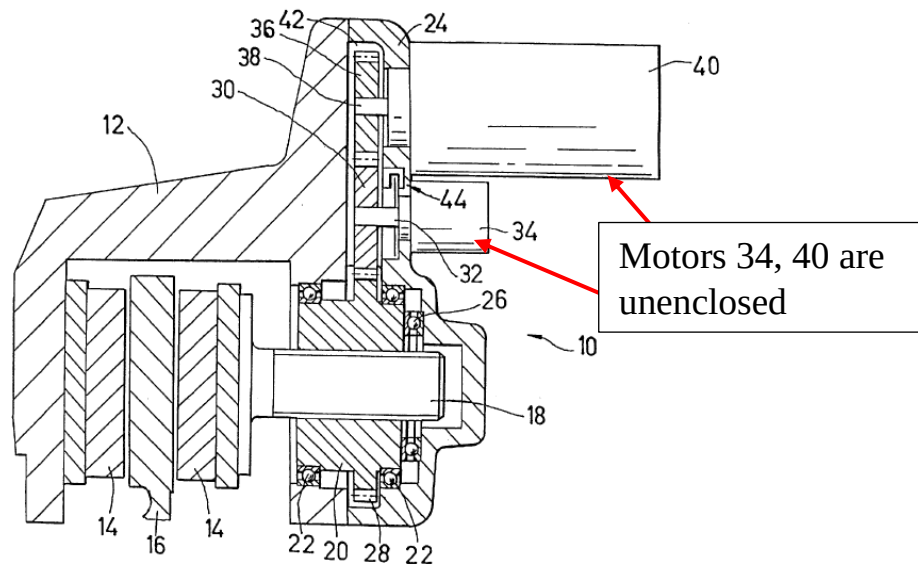
Further, claim 18 recites “said actuator housing comprising a motor isolation cavity receiving at least a portion of said motor.” Petitioners read the claimed actuator housing on the yellow highlighted section of Poertzgen, below. However, there is no evidence that Poertzgen’s motor is actually contained within anything that could be considered a motor isolation cavity.



The above area is not conclusively a cavity. Ex. 2005 at ¶¶ 140-144. It could be some structure connected to the brake caliper of Poertzgen and arranged adjacent the motor. The distinct cross-hatching indicates it may not even part of Poertzgen's unit 40. The structure in question could be a strap for mounting the motor, which would not form a cavity, as is the case in the '415 Patent (see below).



Poertzgen's motor could be unenclosed, as depicted in Schumann (another reference cited in the Petition). Ex. 1009 (sole drawing of which is shown below).



The structure in question in Poertzgen could also be positioned below or above the motor (i.e., in or out of the page, relative to Poertzgen’s drawings).

The drawings of Poertzgen are simply inconclusive as to whether a motor cavity is shown. Ex. 2005 at ¶¶ 140-144.

When addressing this limitation, Petitioners merely conclude, without any basis, that “[p]art of the housing for this subassembly 40... encloses the motor 42” and that “[t]his has a cavity.” See Petition at 27, 50. Petitioners’ position lacks support. Patent Owner has demonstrated several other reasonable possibilities. Therefore, Petitioners have not met their burden of establishing that each and every claim element is taught by the prior art. *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1366-1367 (Fed. Cir. 2016) (Reversing Board’s determination of obviousness when a claim limitation was missing from the cited prior art and the Board had improperly

relied on “common sense” to fill in the missing limitation); *see also In re Wilson*, 424 F.2d 1382, 1385 (CCPA 1970) (“All words in a claim must be considered in judging the patentability of that claim against the prior art.”).

B. Ground 2 – Poertzgen in view of Boucheret and Drennen does not support obviousness of claims 5, 7, 8, or 14-19

Ground 2 is similar to Ground 1 except Petitioners now add Drennen into the combination “[t]o the extent that Patent Owner argues Poertzgen lacks the required sub-frame.” Petition at 62. Indeed, that is one of Patent Owner’s arguments. Drennen is no help for Petitioners on this issue, however. Ex. 2005 at ¶ 145. Even if Petitioners’ combination were made, the alleged sub-frame of Drennen would still be a part of what Petitioners deem the “actuator housing,” which is improper. Further, Drennen does not teach that its block 126 exhibits any of the functionality of a sub-frame, such as allowing one to mount some components of the actuator to the sub-frame to increase the ease of assembly or to allow for pre-installation testing, as examples, such that one would deem Drennen to truly teach a sub-frame. Ex. 2005 at ¶¶ 100-103; 145.

Further, Drennen is a precision actuator, similar to Poertzgen, and is not disclosed as including any vibration isolators. *Id.* While Drennen generally references a bushing, that bushing is used to guide a screw, and Dr. Stein has explained that this bushing would not perform a vibration isolation function. *Id.*

As such, Ground 2 suffers from the same flaws as Ground 1.

C. Ground 3 – Poertzgen in view of Boucheret and Weiler does not support obviousness of claims 5, 7, 8, or 14-19

Ground 3 is similar to Grounds 1 and 2 except Petitioners now add Weiler instead of Drennen “[t]o the extent that Patent Owner argues Poertzgen lacks the required sub-frame.” Petition at 70. Yet again, this is one of Patent Owner’s arguments. Even if Petitioners’ modification were made, the alleged sub-frame from Weiler would still be part of the alleged “actuator housing,” which is not consistent with the meaning of the term “sub-frame.” Further, like Drennen, Weiler lacks any teachings that correspond to those of the disclosed sub-frame. Therefore, the result of the combination of Poertzgen and Weiler would still not result in the claimed “sub-frame.” Ex. 2005 at ¶¶ 146, 147. Finally, Weiler is a precision actuator, like Poertzgen and Drennen, and Weiler does not teach one to bridge the gap between such actuators (which were not known to include vibration isolators due to concerns with maintaining precision) and systems like Boucheret, which were not as focused on precision and could therefore incorporate vibration isolators. Ex. 2005 at ¶¶ 104-111; 146, 147.

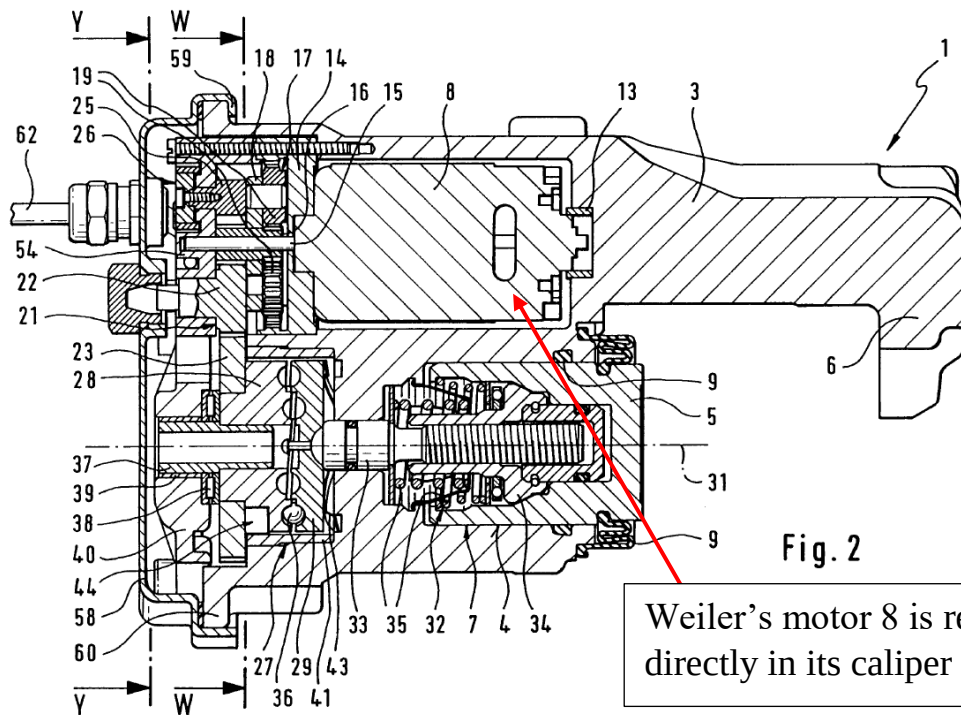
D. Ground 4 – Weiler does not support obviousness of claims 24 or 25

The grounds of rejection that use Weiler as a base reference (i.e., Grounds 4 and 5) are improper for a number of reasons. First, as with Poertzgen, Petitioners

have not appreciated that Weiler is a precision actuator that would not benefit from the addition of isolators. Petitioners have merely alleged that one could have modified Weiler to meet the claims, but Petitioners have not established that one would have had any reason to have done so. Second, Weiler does not disclose the claimed “actuator housing.” Rather, Weiler merely discloses a brake caliper, and one would understand an “actuator housing” to be distinct from a brake caliper. Finally, Petitioners have not addressed that their own statements characterizing Weiler’s disclosure would make the addition of isolators redundant.

1. Weiler

Weiler (Exs. 1012, 1013) teaches a vehicle brake with an electric actuator configured to operate the vehicle brake as a parking brake. The actuator includes a motor 8 that is received directly within the caliper 1, as opposed to a separate actuator housing. The motor 8 drives a shaft 15, which in turn drives a sun gear 16, which in turn drives a planetary gear 17. Planetary gear 17 drives a spur gear 21, which itself includes a driving wheel 22 and an output gear 23. Output gear 23 drives a ramp-type gear 27 which is able to drive a brake piston 5. See Ex. 1012 at pages 8, 9; Figure 2 (copied below).



Weiler's actuator is the type that requires precision mounting of its moving parts. Ex. 2005 at ¶¶ 104-111. Weiler monitors the operational state of its device by tracking the rotations of the motor 8 using sensor 26. Ex. 1012 at 9:1-18. Weiler seeks to position its sensor 26 as close to its motor 8 as possible. Ex. 1012 at 9:1-18. If the motor 8 is misaligned for example, that misalignment would have a negative, cascading effect on all of the downstream mechanisms, namely the various gears connected either directly or indirectly to the motor 8. Ex. 2005 at ¶¶ 104-111; 149-152. Misalignment of the motor 8 and/or the various components of Weiler's actuator brought about by the introduction of isolators would make Weiler's sensor readings unreliable and unreflective of the current actuating state of its device. *Id.*

Further, Weiler's motor 8 is supported at one axial end by a bearing bush 13 and is supported at another axial end by a bearing plate 14 as shown in annotated Figure 2 above. Petitioners' Declarant states that the bearing bush 13 serves an isolation function. See Ex. 1002 at ¶ 276. Despite this admission, Petitioners seek to add additional isolation features relative to Weiler's bearing plate 14. Petitioners do not explain why one would want to add more isolators to Weiler.

Dr. Stein disputes that the bearing bush 13 and bearing plate 14 provide an isolation function. Ex. 2005 at ¶¶ 107, 108. These structures are more likely to facilitate capturing the motor 8 within the housing-like recess and to securely hold the motor 8 in place. *Id.* Again, Weiler would not have included vibration isolators. *Id.* at ¶¶ 149-152.

The disclosure of the '415 Patent cannot be relied upon to provide support to place isolators at any location in Weiler.

2. Bearing bush is not an “isolator,” and lack of motivation

Dependent claim 24 depends from claim 20 and recites “providing a first motor isolation bushing between said portion of said actuator housing and said motor; and providing a second motor isolation bushing between said sub-frame and said motor.” Claim 25 also depends from claim 20, and recites “providing at least one isolation bushing between said portion of said actuator housing and said sub-frame.”

As with Poertzgen, Weiler's electronic parking brake includes a plurality of components coupled to one another in close relationships and with tight tolerances. Ex. 2005 at ¶¶ 104-111. Introducing isolators into Weiler's system would introduce misalignments and unwanted motion that could bring some components out of tolerance, leading to unwanted behaviors and usability concerns. *Id.* at ¶¶ 149-152. In particular, introducing isolators into Weiler would render Weiler's sensor readings unreliable. *Id.* Petitioners do not acknowledge or address the potential downsides of introducing additional isolators into Weiler.

Petitioners' alleged motivation for modifying Weiler relies heavily on Weiler's disclosure of the bearing bush 13. Petitioners state that "having an isolator bushing between the motor and the sub-frame is equally as obvious as having one between the motor and the housing." Petition at 80. Petitioners continue, positing that "[a] POSA would have understood that the bushing 13 between the motor and the housing in Weiler helped isolate the motor, and that having another bushing between the motor and sub-frame would further isolate the motor." *Id.* Petitioners then argue that duplicating and moving the bearing bush 13 of Weiler would have been obvious.

However, according to Dr. Stein, there is no evidence that the bearing bush 13 is actually designed to function as a vibration isolator. Ex. 2005 at ¶¶ 107, 108.

Rather, the bearing bush 13 likely performs the function of increasing the ease of inserting the motor and radially supporting the motor. *Id.* The bearing plate 14, on the other hand, is designed to axially and rotationally hold the motor 8 in place. *Id.* Therefore, the bearing bush 13 is not “a first motor isolation bushing between said portion of said actuator housing and said motor” as Petitioners allege. Regardless, Petitioners seek to essentially duplicate bearing bush 13 (which is not actually a vibration isolator) and use it relative to the bearing plate 14. However, introducing a bearing bush 13 between bearing plate 14 and motor 8 would make it difficult if not impossible for the bearing plate 14 to resist rotation of the motor 8. *Id.* at ¶¶ 107, 108; 149-152. Petitioners have not acknowledged this issue let alone proposed a solution for it. There is simply no reason to add any vibration isolators to Weiler’s system, let alone between the bearing plate 14 and motor 8. For at least these reasons, Petitioners have not set forth a proper motivation to combine.

3. The “actuator housing” does not read on Weiler’s caliper

Petitioners read the claimed “actuator housing” on the area within a yellow box (Petition at 74), which is merely a portion of Weiler’s brake caliper 1. One would not read the claimed “actuator housing” on a brake caliper, as explained above. *Ex. 2005* at ¶¶ 153, 154.

Weiler even states that the alleged actuator housing is merely a “housing-like recess” of its brake caliper. A housing-like recess is not an actuator housing,

consistent with how that term is used in the claims, as interpreted in light of the specification. Rather, a “housing-like recess” is just a recess in Weiler’s brake caliper that happens to serve some of the functions of a housing, but is indeed not a separate housing (hence the term “housing-like”). Further, Weiler deems separate electronic parking brake assemblies, like those of Poertzgen, to require a “complex overall structural design.” Ex. 1012 at 1:26-2:10. So, Weiler acknowledges that separate electronic parking brake assemblies exist but instead chooses to mount its electric park brake components directly into a housing-like section of its brake caliper.

Finally, a reference cited during prosecution of the ’415 Patent disclosed an actuator arranged within a brake caliper, and the Examiner chose to issue a notice of allowance despite being aware of that reference. *See* Ex. 1004 at page 65 (Examiner lists U.S. Patent No. 6,397,981 to Tamasho et al. (cited as Ex. 2008) on Notice of References Cited).

4. Petitioners have not addressed redundancy

While Patent Owner does not agree that Weiler discloses isolators, adding the claimed isolators to Weiler would be redundant in view of Petitioners’ characterization of Weiler as already having existing isolation and load dissipation features. Petitioners do not address this logical discrepancy. Ex. 2005 at ¶ 155.

Again, dependent claim 24 recites a sub-frame/motor isolator (“providing a second motor isolation bushing between said sub-frame and said motor,” such as red isolation bushing 318) and claim 25 recites a sub-frame/housing isolator (“providing at least one isolation bushing between said portion of said actuator housing and said sub-frame,” such as purple isolator 326). With respect to claim 24, Petitioners argue that since Weiler includes a bearing bush 13 at one end of its motor 8, it would be obvious to provide one at the other end of its motor 8, between the motor 8 and the bearing plate 14 as a matter of duplicating a known element. Petition at 80-81. But Petitioners have already alleged that bearing bushes 13 and bearing plates 14 are known to accomplish at least some, if not all, of the functions of the isolator Petitioners seek to add to Weiler. Adding another bushing between the motor 8 and bearing plate 14 would be unnecessary or redundant in view of Weiler’s existing bush bearing 13 and bearing plate 14. Petitioners have not refuted, and cannot refute, this point. There is no *prima facie* case of obviousness for this separate reason. *TRW Automotive U.S. LLC v. Magna Electronics, Inc.*, IPR2015-00972, Paper 9 at 12 (September 16, 2015) (denying institution of IPR when finding no reason to combine where “the camera in [the ’094 patent] already is mounted to the windshield using a bracket and does not require the direct optical coupling provided by the fastening device in [the ’633 patent]”); *see also Stryker Corp. v. Karl Storz Endoscopy*

America, Inc., IPR2015-00764, Paper 13 at 13 (September 2, 2015) (denying institution of IPR because “we fail to see, and Petitioner does not adequately explain, why it would be obvious to add a translator to redundantly perform the function that Petitioner maintains is performed by the interconnect devices and network computer located within the surgical network.”).

With respect to claim 25, Petitioners argue that it would have been obvious to add another bushing between the bearing plate 14 and the alleged actuator housing. Petition at 82. However, Petitioners have not explained why one would have wanted to do so, nor have Petitioners addressed whether adding such a bushing would have been redundant in view of Weiler’s existing isolation features.

So, either Weiler’s bearing bush 13 and bearing plate 14 do not serve a vibration isolation function, which is consistent with Dr. Stein’s view that the precision system of Weiler would not benefit from vibration isolators, or the bearing bush 13 and bearing plate 14 already do function as vibration isolators, in which case Petitioners are making unnecessary changes to Weiler solely for the purpose of attempting to invalidate the claims, which is improper hindsight.

Petitioners seemingly acknowledge the weaknesses in relying on Weiler, alone, to teach the specifically-claimed isolation bushings because Petitioners

alternatively rely on Boucheret to supply the missing isolation bushings in the next ground. Boucheret does not support Petitioners' position, however.

E. Ground 5 – Weiler in view of Boucheret does not support obviousness of claims 24 or 25

Petitioners introduce Ground 5 to address the possibility that “Patent Owner argues Weiler fails to teach the required isolation bushings.” Petition at 83. Patent Owner has shown that Weiler does indeed fail to teach the claimed isolation bushings.

Again, as mentioned above, Petitioners have not even alleged there would be any vibration experienced at the locations where it seeks to add isolators into Weiler. Ex. 2005 at ¶¶ 104-111 and 156-159.

Patent Owner maintains, regardless of the teachings of Boucheret, that one would not have added isolators into Weiler for essentially the same reasons articulated above—Weiler is a precision positioning device, adding isolators would introduce misalignments and motion into Weiler's device, and would render Weiler's sensor readings unreliable. *Id.* Further, Petitioners have not properly accounted for the claimed “actuator housing” for the same reasons outlined above. *Id.* Further still, Petitioners have not adequately addressed whether adding the claimed isolation bushings to Weiler, which already includes a bearing bush 13 and

bearing plate 14, would be redundant. *Id.* In this regard, Ground 5 fails for the same reasons as Ground 4 despite the addition of Boucheret.

Further still, Boucheret teaches one to mount a motor with radial lugs, and to absorb axial, tangential, and radial vibrations with radially-mounted dampers, and as such Boucheret's teachings would not lead one to the claimed combinations. Critically, Boucheret teaches one to absorb vibrations from a common location (radially outward of the motor). However, claim 24 recites isolators in two distinct locations: between the actuator housing and the motor, and between the sub-frame and the motor. Boucheret does not teach one to place isolators in these distinct locations. Ex. 2005 at ¶ 159. Further, claim 25 recites "providing at least one isolation bushing between said portion of said actuator housing and said sub-frame." Boucheret does not teach one to place an isolator between an actuator housing and a sub-frame. Boucheret at best teaches one to place isolators relative to a motor, and one would not have extrapolated from Boucheret's disclosure a teaching that one should place an isolator relative to two completely different structures, let alone in the context of a precision device like Weiler. Claims 24 and 25 are non-obvious for these additional reasons.

Here again, as to claim 24, plural isolators would only increase the amount of undesirable movement in the precision actuator of Weiler. Ex. 2005 at ¶ 139.

VI. EVIDENCE OF NON-OBVIOUSNESS

Secondary considerations are anything but “secondary.” *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1349 (Fed. Cir. 2012) (secondary considerations may often be the most probative and cogent evidence in the record).

A. Copying

The focus of the copying analysis is whether others made efforts to replicate Patent Owner’s invention. There is clear copying in this case. Ex. 2005 at ¶ 163. In February of 2003, Patent Owner gave a presentation to TRW (one of the real-parties-in-interest of Petitioners). Ex. 2012 at page 1; Ex. 2011 at ¶ 4. The presentation described a prototype design embodying the invention of the ’415 Patent. A sub-frame and at least one isolator is shown on page 22 of the presentation. *See* Ex. 2012 at page 22; Ex. 2011 at ¶¶ 5, 6. The presentation also indicates that the prototype design provides for “added sound/vibration isolation.” *See* Ex. 2012 at page 4. The presentation also provides test data comparing the noise of TRW’s existing design, which did not include a sub-frame or isolators, to Patent Owner’s prototype design. Ex. 2012 at pages 14-20; Ex. 2011 at ¶¶ 7-13. The test results demonstrate a notable drop in noise relative to TRW’s existing design. *Id.* It is no coincidence that Petitioners later introduced an updated design with a sub-frame and vibration isolators. Ex. 2016; Ex. 2005 at ¶ 163. In summary, Petitioners were presented with

evidence that an EPBA incorporating a sub-frame and isolators would lead to reduced noise, and then Petitioners copied Patent Owner's design.

B. Praise

The industry has praised Patent Owner's invention. Ex. 2005 at ¶ 165. Specifically, Petitioners have praised Patent Owner's invention by boasting about the robust sales and functionality of Petitioners' electronic park brake. Taking full advantage of the benefits of the '415 Patent, Petitioners brag that "[i]n addition to providing park brake functionality, EPB is a fully integrated part of the brake system with features such as dynamic actuation, brake pad wear sensing and offers reduced degradation associated with mechanical systems." Ex. 2010. An executive of Petitioners is quoted as referring to their product as a "great success story." *Id.* Petitioners have allegedly sold over 200 million units of the infringing, copied product. *Id.*

C. Commercial success

Patent Owner has not sold an EPBA covered by the '415 Patent. Nevertheless, the claimed invention has been a commercial success. Specifically, a patentee is entitled to rely on the commercial success of an infringer's use of an infringing product or method to demonstrate the nonobviousness (i.e. validity) of the patentee's invention. *Brown & Williamson Tobacco Corp. v. Philip Morris, Inc.*, 229 F.3d 1120, 1130 (Fed. Cir. 2000) ("Our case law provides that the success of an infringing

product is considered to be evidence of the commercial success of the claimed invention.”).

As shown in Ex. 2010, as of May 23, 2022, Petitioners claim to have sold 200 million units of the infringing product. The product is undoubtedly a commercial success. Albeit, one copied from another’s idea.

Petitioners’ market share is significant as the infringing product is standard on many vehicle lines with household names, such as the Jeep Cherokee. Ex. 2009. A number of reports commenting on the current state of the EPBA market refer to Petitioners as a “key player” or a “key company” in the market which has a value in excess of \$1B globally. *See* Exs. 2017, 2018. Given the number of competitors in the market including established firms such as Hyundai, Robert Bosch, Aisin, Dura, etc., Petitioners presence in the market is significant.

Further, a nexus should be presumed because each of the accused devices at issue are coextensive with at least one independent claim of the ’415 Patent. Ex. 2016; Ex. 2005 at ¶ 166; *Brown*, 229 F.3d at 1130 (if a marketed product embodies the claimed features, and is coextensive with them, then a nexus is presumed and the burden shifts to the party asserting obviousness). Further, products such as electronic park brake actuators are not heavily advertised using fanciful ad campaigns like some consumer goods. Thus, external, unclaimed factors are unlikely to have driven

sales. More generally, the claimed features, as opposed to any unclaimed ones, constitute the essence of the infringing product, are significant to its function, and drive its market success.

D. The Evidence of Non-Obviousness is Substantial

The body of evidence presented above demonstrates that the novel aspects of the '415 Patent led to copying, commercial success, and praise in the industry. As such, even if Petitioners had established a *prima facie* case of obviousness, which it has not, Patent Owner's evidence sufficiently rebuts any such *prima facie* case and the inventions recited in the challenged claims would not have been obvious.

VII. NO JURISDICTION

Patent Owner maintains that the Board lacks jurisdiction over expired patents. In *Oil States*, the Supreme Court explained that the “decision to grant a patent is a matter involving public rights—specifically, the grant of a public franchise.” *Oil States Energy Servs., LLC v. Greene’s Energy Grp., LLC*, 138 S. Ct. 1365, 1373 (2018). When a patent expires, however, the public franchise ceases to exist and the franchisee (e.g., the patent owner) no longer has the right to exclude others. At most, the franchisee may be entitled to collect damages from the public franchise that formerly existed through an infringement action in district court. But because the public franchise no longer exists, the PTO has nothing in its authority to cancel or amend. Expiration removes the patent from the PTO’s jurisdiction and returns it to

the sole jurisdiction of the Article III courts, which have exclusive authority to govern claims for damages. If this were not so, the PTO would purport to have authority to retroactively modify a public franchise that no longer exists, in a setting where the expired public franchise does not enjoy any presumption of validity, and in which amendment of claims is no longer practical, let alone permitted.

This is further confirmed by the statutory scheme governing IPRs. Integral to the IPR process is the ability of a Patent Owner to move to amend its claims. 35 U.S.C. § 316(a)(9); 37 C.F.R. § 42.121. This opportunity for amendment explains the lower burden of proof required to invalidate a patent in an IPR as compared to in an Article III proceeding in district court, where the patent-in-suit cannot be amended. *Compare* 35 U.S.C. § 316(e) (“In an *inter partes* review instituted under this chapter, the petitioner shall have the burden of proving a proposition of unpatentability by a preponderance of the evidence.”); *Microsoft Corp. v. i4i Ltd. P’ship*, 564 U.S. 91, 95 (2011) (invalidity defense to patent infringement in district court must be proved by clear and convincing evidence). The patent at issue in this

IPR is expired. As a result, a motion to amend would be fruitless² and the Board would have discretion to deny it on that basis. 37 C.F.R. § 42.121(d)(3).

It is clear that Congress did not intend to grant the Board jurisdiction to consider an IPR of an expired patent. Otherwise, expired patents would be subject to the lower burden of proof for invalidation without the justification of the opportunity to amend the expired patents. Considering the validity of expired patents must be left to Article III courts, which apply the higher clear and convincing standard. Since the '415 Patent expired before the Petition was filed, the Board does not have jurisdiction over the '415 Patent, and the IPR should not have been instituted as a result.

VIII. NOT CONSTITUTIONAL

A. IPRs Violate Due Process Rights

When a petition for an IPR is filed, the petitioner must pay a fee of \$19,000. If the IPR is instituted, the petitioner must pay a second fee of \$22,500. Since 2021,

² While the controlling statutes are silent as to amendments of an expired patent, Congress has acknowledged that expired patents cannot be amended before by statutorily prohibiting such action in the analogous *ex parte* reexamination proceeding. 37 C.F.R. § 1.530(j).

these post-institution fees have amounted to more than \$20 million per year, and represent about 24% of the Board’s total budget and about 40% of the Board’s AIA trial proceedings budget.³ There is thus an incentive for the Board to favor institution. This is especially problematic because Board leadership holds dual executive (financial) and judicial functions. That is, the same people making decisions about the merits of an IPR also participate in making financial decisions about the operation of the Board. *See, e.g., Mobility Workx, LLC v. Unified Patents, LLC*, 15 F.4th 1146, 1154 (Fed. Cir. 2021) (acknowledging that the chief APJ, the Deputy APJ, and the Vice Chief APJs assist the Director of the USPTO in various budgetary functions); *see also Id.* at 1165 (noting with respect to the possibility of structural bias within the Board that it is the Court of Appeals for the Federal Circuit’s responsibility to assure the Board is “adequately scrupulous in their avoidance of bias and the appearance of bias.”) (Newman, P., dissenting).

This is a source of impermissible structural bias within the Board and violates litigants’ due process rights. *See, e.g., Ward v. Vill. of Monroeville*, 409 U.S. 57, 60 (1972) (unconstitutional structural bias existed where substantial institutional

³ *See* USPTO Aggregate Revenue Tables, available at

<https://www.uspto.gov/about-us/performance-and-planning/fee-setting-and-adjusting>

funding, there almost half of a village's income, depended on a particular judicial outcome, there the imposition of certain fines and fees, both overseen by the mayor).

A recent report by the Government Accountability Office⁴ has revealed that the management practices of the USPTO and Board affects the independence of the Board judges. 67 percent of judges "reported feeling pressure to change or modify an aspect of their decision in an AIA proceeding" based on internal review procedures, including with respect to institution decisions. Exhibit 2004 at 2, 35, 59. 21 percent of judges indicated they were pressured to change or modify the overall outcome of a proceeding as a result of these internal review procedures. *Id.* at 63. 15 percent of judges indicated that in their opinion, the Board management's influence on the outcome of a proceeding has been inappropriate all of the time. *Id.* at 68. This information, viewed in light of the structural issues discussed above, underscores due process deficiencies in the IPR procedure.

B. The Institution Procedure Violates the Appointments Clause

The authorizing statutes for IPRs granted the Director authority to institute an IPR. 35 U.S.C. § 314. However, shortly after enactment of those statutes the authority to institute an IPR was delegated to the Board. *Changes to Implement Inter*

⁴ Available at <https://www.gao.gov/assets/gao-23-105336.pdf> and attached hereto as Ex. 2004.

Partes Review Proceedings, Post-Grant Review Proceedings, and Transitional Program for Covered Business Method Patents, 77 Fed. Reg. 48612, 48647 (Aug. 14, 2012).

This delegation is in conflict with a recent Supreme Court decision. In *United States v. Arthrex*, the Supreme Court confirmed that final decisions made on behalf of the USPTO in an IPR must be made by a principal officer, one who is appointed by the President with the advice and consent of the Senate. *United States v. Arthrex, Inc.*, 141 S. Ct. 1970, 1985 (2021). At issue in *Arthrex* was a Final Written Decision issued at completion of an IPR, but the same principle stands for institution decisions, which are also final and nonappealable. *See* 35 U.S.C. § 314(d); *Cuozzo v. Speed Techs, LLC*, 579 U.S. 261, 266 (2016). Board judges are not principle officers and therefore they cannot act alone on behalf of the USPTO by rendering final institution decisions. *Arthrex*, 141 S. Ct. at 1985. This problem has been highlighted by Judge Newman of the United States Court of Appeal for the Federal Circuit, and is ripe for review. *See Mobility Workx*, 15 F.4th at 1161 (Newman, P., dissenting).

Respectfully Submitted,

CARLSON, GASKEY & OLDS, P.C.

/Timothy J. Murphy/
Timothy J. Murphy
Registration No. 64,613
400 West Maple, Suite 350
Birmingham, MI 48009
Telephone: (248) 283-0732

CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(b)(1), the undersigned hereby certifies that the foregoing document contains 13,448 words, excluding a table of contents, a table of authorities, mandatory notices under 37 C.F.R. § 42.8, a certificate of service or word count, or appendix of exhibits or claim listing, as measured by the word-processing system used to prepare this paper.

Respectfully Submitted,

CARLSON, GASKEY & OLDS, P.C.

/Timothy J. Murphy/
Timothy J. Murphy
Registration No. 64,613
400 West Maple, Suite 350
Birmingham, MI 48009
Telephone: (248) 283-0732

CERTIFICATE OF SERVICE

The undersigned certifies that a copy of the foregoing document was served electronically via email in its entirety on the following:

ZFIPRService@bannerwitcoff.com

John R. Hutchins

jhutchins@bannerwitcoff.com

Paul T. Qualey

pqualey@bannerwitcoff.com

Shambhavi Patel

spatel@bannerwitcoff.com

Banner & Witcoff, Ltd.

1100 13th Street, NW, Suite 1200

Washington, DC 20005

Tel: (202) 824-3000

Fax: (202) 824-3001

Petitioners have consented to electronic service.

Respectfully Submitted,

CARLSON, GASKEY & OLDS, P.C.

/Timothy J. Murphy/

Timothy J. Murphy

Registration No. 64,613

400 West Maple, Suite 350

Birmingham, MI 48009

Telephone: (248) 283-0732