

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MERCEDES-BENZ USA, LLC,
Petitioner,

v.

WESTPORT FUEL SYSTEMS CANADA INC.,
Patent Owner

Inter Partes Review No. IPR2023-00351
Patent No. 6,575,138

PATENT OWNER'S PRELIMINARY RESPONSE

TABLE OF CONTENTS

TABLE OF AUTHORITIES	ii
PATENT OWNER’S EXHIBIT LIST	iv
I. Introduction.....	1
II. Background and Overview of Inventors’ Solution.....	2
III. Legal Standards	8
A. Level of Ordinary Skill	8
B. Claim Construction.....	8
IV. Petitioner’s Validity Challenge	8
V. Neither Gottlieb nor Gottlieb (DE) are Prior Art under Pre-AIA §102	9
A. Gottlieb	9
1) Pre-AIA 35 U.S.C. §102(e)(1).....	10
2) Pre-AIA 35 U.S.C. §102(e)(2).....	10
2(a). Conception and Actual Reduction to Practice	11
2(b). Westport is Entitled to Claim Priority to the ’791 Provisional Filing Date.	18
B. GOTTLIEB (DE)	29
1) Pre-AIA 35 U.S.C. §102(a).....	30
2) Pre-AIA 35 U.S.C. §102(b)	31
3) Pre-AIA 35 U.S.C. §102(e)(1).....	31
4) Pre-AIA 35 U.S.C. §102(e)(2).....	32
VI. Real Parties-in-Interest	32
VII. Conclusion	33
CERTIFICATE OF SERVICE	34
CERTIFICATE OF WORD COUNT.....	35

TABLE OF AUTHORITIES

	Page(s)
Cases	
<i>Ariad Pharms., Inc. v. Eli Lilly & Co.</i> , 598 F.3d 1336 (Fed. Cir. 2010) (en banc)	21
<i>Atlanta Attachment Co. v. Leggett & Platt, Inc.</i> , 516 F.3d 1361 (Fed. Cir. 2008)	16
<i>Coleman v. Dines</i> , 754 F.2d 353 (Fed. Cir. 1985)	12
<i>Eiselstein v. Frank</i> , 52 F.3d 1035, 34 U.S.P.Q.2D (BNA) 1467 (Fed. Cir. 1995).....	21
<i>EZ Dock v. Schafer Sys., Inc.</i> , 276 F.3d 1347 (Fed. Cir. 2002)	16
<i>Lockwood v. Amer. Airlines, Inc.</i> , 107 F.3d 1565 (Fed. Cir. 1997)	23
<i>Mahurkar v. C.R. Bard, Inc.</i> , 79 F.3d 1572 (Fed. Cir. 1996)	11
<i>Ex parte O’Sullivan</i> , No. 2018-001684, 2018	21
<i>Phillips v. AWH Corp.</i> , 415 F.3d 1303, Fed. Cir. 2005	8
<i>PowerOasis, Inc. v. T-Mobile USA, Inc.</i> , 522 F.3d 1299 (Fed. Cir. 2008)	20
<i>REG Synthetic Fuels, LLC v. Neste Oil Oyj</i> , 841 F.3d 954 (Fed. Cir. 2016)	11
<i>Rhine v. Casio, Inc.</i> , 183 F.3d 1342 (Fed. Cir. 1999)	8

<i>Scott v. Finney</i> , 34 F.3d 1058, 32 USPQ2d 1115 (Fed. Cir. 1994)	16
<i>SK Hynix Inc. v. Netlist, Inc.</i> , IPR2020-01044 (PTAB Dec. 17, 2020)	19, 20, 21
<i>In re Skvorecz</i> , 580 F.3d 1262 (Fed. Cir. 2009)	23
<i>Winter v. Lebourg</i> , 394 F.2d 575 (C.C.P.A. 1968)	16
Statutes	
35 U.S.C. §102	2, 9, 29, 32
35 U.S.C. §102(a)	30, 31
35 U.S.C. §102 (a), (b).....	9
35 U.S.C. §102(b)	31
35 U.S.C. §102(e)	2, 9, 10, 28, 29
35 U.S.C. §102(e)(1).....	10, 31
35 U.S.C. §102(e)(2).....	10, 11, 18, 32
35 U.S.C. §112.....	18
35 U.S.C. §119(a)	9
35 U.S.C. §119(a) to a.....	11
35 U.S.C. §122(b)	10, 31
35 U.S.C. §312(a)(2).....	32, 33
American Inventors Protection Act of 1999	10

PATENT OWNER'S EXHIBIT LIST

Exhibit	Description
2001	German Patent Publication DE 198 54 506 C1
2002	Declaration of David Mumford
2003	Declaration of Dr. Christopher Atkinson
2004	CV of Dr. Christopher Atkinson
2005	Technical Update #3, dated July 16, 1999
2006	J40 Design Calculations List, dated September 23, 1999
2007	Drawing J40-INJ-100 (“J40 Assembly Drawing”)
2008	Westport File Lists
2009	Email from Alan Welch dated February 11, 2000

Patent Owner, Westport Fuel Systems Canada Inc. (“Westport”), hereby submits its Preliminary Response to the Petition for *inter partes* review of U.S. Patent No. 6,575,138 (the “’138 Patent”).

I. Introduction

Petitioner Mercedes-Benz USA, LLC (“Mercedes” or “Petitioner”) filed their petition challenging the patentability of Westport’s expired ’138 Patent. Mercedes has also filed IPR2023-00293 (the “293 IPR”) to challenge the ’138 Patent and has ranked the petition of the 293 IPR above this petition. Although Mercedes was joined by Robert Bosch LLC (“Bosch”) in the 293 IPR, Bosch has not joined this petition.

Mercedes presents two grounds of unpatentability, both relying on U.S. Patent No. 6,530,273 (“Gottlieb”) either alone or in combination with a Published German Application DE 198 38 862 A1 (“Gottlieb (DE)”).

As Gottlieb is not prior art to the ’138 Patent on its face. The Petition, however, relies on Mercedes’ assertion that the ’138 Patent is not entitled to the priority claim to Provisional Application 60/159,791 (the “’791 Provisional”) and is only entitled to the filing date of the non-provisional U.S. Patent Application 09/522,130 (the “’130 Application”), which was March 9, 2000. Although the Petition wholly fails to show that the ’138 Patent is not entitled to the priority of the ’791 Provisional, the Board need not even conduct that analysis as Gottlieb would

not be prior art to the '138 Patent even based on the filing date of the '130 Application.

The Petition's focus on filing dates over invention dates shows a concerning lack of awareness of the actual text of, and jurisprudence surrounding, pre-AIA 35 U.S.C. §102(e) and, in particular, what is and is not available as prior art under pre-AIA law. This lack of even a minimal contemplation of invention dates is particularly troubling given that Mercedes had access to evidence showing Westport's dates of conception and reduction to practice through the Texas Litigation¹ and seemingly ignored this critical information in filing its Petition.

The Board should deny institution because the Petition fails to set forth any grounds of unpatentability based on patents or printed publications that constitute prior art under the applicable pre-AIA 35 U.S.C. §102. For this simple reason, Westport submits the challenged claims are not unpatentable based on the grounds presented. Mercedes' petition should therefore be denied.

II. Background and Overview of Inventors' Solution

Patent Owner, Westport, has been in the business of developing technology to use natural gas, and other alternative gaseous fuels, as fuel to reduce emissions from internal combustion engines since the 1990s. Westport's research and

¹ Case NO. 2:21-CV-454.

development efforts have made them a leading supplier of advanced fuel delivery components and systems for a wide range of low-carbon fuels. Westport currently sells products in seventy countries and has exceeded \$200 million in revenue each year since at least 2017.

At the time of the invention, Westport was involved in a project for a major automobile manufacturer where Westport was tasked with developing technology directed to the development of a fuel system that could provide commercially viable power, efficiency, and performance.

Directly injecting fuel at high pressure into the combustion chamber of an internal combustion engine at specific times during the combustion cycle was known to provide advantages in both engine performance and reducing emissions. However, injecting fuel at high pressure created difficulties in developing fuel injection valves that were durable, could operate rapidly and precisely, and provided a highly reliable seal to prevent fuel leakages. Gaseous fuels demanded even better performance than liquid fuels.

The needed fuel injection valve also had to remain securely closed when not actuated, including as the valve thermally expanded and contracted during fluctuations in temperature typically found in the ambient environment and in an internal combustion engine heated from operation.

Conventional fuel injection valves did not adequately meet these requirements. Many conventional fuel injection valve designs were plagued by reliability issues caused by wear that reduced the valve's ability to reliably seal. Other valve designs employed complicated hydraulic pressure based systems that, while effective, could not operate at the high speeds and with the precision needed for direct injection applications. Fast-acting piezoelectric and magnetostrictive actuators were known but there were challenges associated with designing fuel injection valves incorporating these types of actuators due to the temperature ranges at which internal combustion engines operate and the impact loads applied by the actuators during rapid operation.

In or around 1999, Alan B. Welch, Irawan Rahardja, and Mike Hebbes (collectively, the "Inventors") developed a new fuel injection valve to address these needs and described the features of that valve in U.S. Provisional Application 60/159,791 (the "'791 Provisional"), which was filed on October 15, 1999. Non-provisional U.S. Patent Application No. 09/522,130 (the "'130 Application") was filed on March 9, 2000 and claimed priority to the '791 Provisional. The '130 Application was duly examined by the Patent Office and issued as U.S. Patent No. 6,298,829 (the "'829 Patent"), entitled "Directly Actuated Injection Valve," on October 9, 2001.

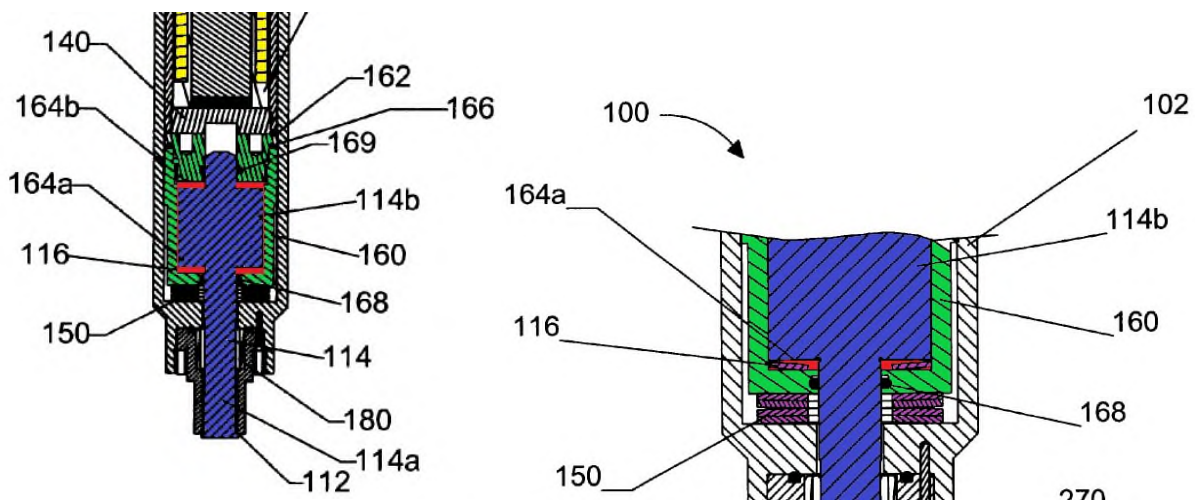
Non-provisional U.S. Patent Application No. 09/863,187 (the “’187 Application”) was filed on May 23, 2001 as a continuation-in-part of the ’130 Application and claimed priority to the ’791 Provisional. The ’187 Application was duly examined by the Patent Office and issued as the ’138 Patent, entitled “Directly Actuated Injection Valve,” on June 10, 2003.

Both the ’829 Patent and the ’138 Patent expired on March 9, 2020.

In general, the ’138 Patent is directed to a high pressure fuel injection valve that includes a passive hydraulic link that “provide[s] a load path for the opposing actuating forces that originate from at least one spring member and the actuator assembly.” Ex. 1001 at 7:24-56. The passive hydraulic link also allows for the correction for differential thermal expansion, wear, and dimensional variability and tolerance. *Id.* at 7:47-65.

The claimed inventions of the ’138 Patent resolve the technical problems related to rapid, high pressure fuel injection by providing, among other features, a passive hydraulic link having a hydraulic fluid through which “opening and closing forces are transmitted,” and wherein the “hydraulic fluid acts substantially as a solid” while the actuator assembly is actuated and is “adjustable” while the actuator is not activated. *Id.* at 17:42-53.

Annotated Figs. 1 and 2 of the '138 Patent are shown below with the valve member 114 shaded in blue, the connected cylinder 160 and cap 162 shaded in green, the actuator 130 shaded in yellow, and the valve spring 116 and disc spring 150 shaded in purple. Hydraulic fluid 164a/b (shaded in red) fills the cylinder 160 and forms a thin layer of fluid in between the valve member and the cylinder.



“The opening force generated by the actuator assembly is transmitted to valve member 114 through a hydraulic link assembly.” *Id.* at 11:65-67. “Furthermore, the hydraulic fluid preferably has a sufficiently high viscosity and bulk modulus so that it acts as an incompressible solid when activation of the actuator assembly causes a valve opening force to be quickly transmitted through the hydraulic fluid between the bottom of cylinder 160 and hydraulic piston 114b.” *Id.* at 12:26-31.

“An opening force, originating from expanding magnetostrictive member 130 is transmitted through sliding pole 140, cylinder cap 162, hydraulic fluid 164b disposed within the space between cylinder cap 162 and a planar surface of hydraulic piston 114b, and finally, through piston 114b, which in the illustrated embodiment is integral with valve member 114. The opening force is greater than the closing force, which results in compression of valve spring 116.” *Id.* at 14:16-24.

“When injection valve 100 is at rest in the closed position, the closing force that biases valve member 114 against valve seat 112 originates from valve spring 116 and disc spring 150.” *Id.* at 13:57-60. “When injection valve 100 is closed and at rest, the closing force is transmitted through the hydraulic fluid held between cylinder cap 162 and hydraulic piston 114b.” *Id.* at 12:46-48.

“When injection valve 100 is closed, the hydraulic link assembly automatically self-adjusts so that the position of hydraulic cylinder 160 relative to hydraulic piston 114b is corrected to account for the effects of temperature, wear, and any small movements of valve member 114 relative to hydraulic cylinder 160 that may have occurred while valve member 114 was in the open position. Auto-adjustments are accomplished by the migration of hydraulic fluid from chamber 164b on one side of hydraulic piston 114b to chamber 164a on the other side of hydraulic piston 114b . . .” *Id.* at 15:15-25.

III. Legal Standards

A. Level of Ordinary Skill

For purposes of this preliminary response, Patent Owner submits that a POSITA in the timeframe of the invention would have had a degree in mechanical engineering or a similar discipline along with 2 years of professional experience working with fuel injectors or fuel injection systems for internal combustion engines. Ex. 2003 at ¶9.

B. Claim Construction

In *inter partes* reviews, the Board construes claim terms based on their ordinary and customary meaning in accordance with *Phillips v. AWH Corp.*, 415 F.3d 1303, Fed. Cir. 2005) (en banc). Claims should be construed so as to sustain their validity, if possible. *Rhine v. Casio, Inc.*, 183 F.3d 1342, 1345 (Fed. Cir. 1999). The specification is the “best source for understanding a technical term,” to be supplemented, “as needed, by the prosecution history.” *Philips* at 1315. For the purposes of institution, Patent Owner contends that no term requires express construction but explicitly reserves the right to construe claim limitations should the Board institute review.

IV. Petitioner’s Validity Challenge

Petitioner challenges independent claim 1 and dependent claims 2-3, 6, 13-14, 16-22, 26-28 and 41 on the following grounds:

Ground	References	Basis	Claims
1a	Gottlieb	102/103	1-3, 6, 13-14, 16-17, 19-21, 26-28 and 41
1b	Gottlieb and Gottlieb (DE)	103	14, 18, 22

V. Neither Gottlieb nor Gottlieb (DE) are Prior Art under Pre-AIA §102

As patents or patent applications filed by another, in order to be considered prior art to the '138 Patent, both Gottlieb and Gottlieb (DE) would have to fall under one of pre-AIA 35 U.S.C. §102 (a), (b), or (e). The Petition asserts Gottlieb is prior art under pre-AIA 35 U.S.C. §102(e) based on an earlier filing date but does not identify under which section of §102 Mercedes believes that Gottlieb (DE) should be considered prior art. This preliminary response will first address why Gottlieb is not prior art to the '138 Patent and will then address why Gottlieb (DE) is not prior art to the '138 Patent.

A. Gottlieb

On November 24, 1999, Gottlieb was filed in the United States as U.S. Patent Application No. 09/449,084. Ex. 1004, pg.1. The application claimed priority under pre-AIA 35 U.S.C. §119(a) to German patent application DE 19854506. *Id.* The German patent application DE 19854506 was originally filed on November 25, 1998 and was first published in Germany on April 4, 2000. Ex. 2001, pg. 1. Gottlieb was first published on March 11, 2003 as an issued patent. Ex. 1004, pg.1. The Petition

argues that Gottlieb “is prior art under at least pre-AIA §102(e) because it was filed before the filing date of the ’138.” Pet. 24.

1) Pre-AIA 35 U.S.C. §102(e)(1)

Under pre-AIA 35 U.S.C. §102 (e)(1), “[a] person shall be entitled to a patent unless - the invention was described in — (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent.” Gottlieb was filed on November 24, 1999, before the November 29, 2000 effective date of the American Inventors Protection Act of 1999, which first provided for publication of patent applications under 35 U.S.C. §122(b). Because Gottlieb was not published under section 122(b), it is not prior art under pre-AIA 35 U.S.C. §102 (e)(1).

2) Pre-AIA 35 U.S.C. §102(e)(2)

Under pre-AIA §102 (e)(2), “[a] person shall be entitled to a patent unless - the invention was described in . . . (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for the purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.”

Gottlieb was filed in the United States on November 24, 1999 and claimed priority under 35 U.S.C. §119(a) to a German application. Ex. 1004 at 1. Because the German application was not filed “under the treaty defined in section 351(a)” (i.e., a PCT application), Gottlieb’s critical date under pre-AIA §102(e)(2) is the date on which Gottlieb was filed in the United States, which is November 24, 1999. Therefore, Gottlieb does not qualify as prior art under pre-AIA §102(e)(2), if the Patent Owner can demonstrate invention prior to the critical date of November 24, 1999.

Prior invention of a pre-AIA patent can be established by: (1) establishing an earlier reduction to practice of the claimed invention before the critical date of the reference, or (2) establishing conception of the invention prior to the critical date plus reasonably continuous diligence to reduce the invention to practice after the critical date. *REG Synthetic Fuels, LLC v. Neste Oil Oyj*, 841 F.3d 954, 958 (Fed. Cir. 2016).

2(a). Conception and Actual Reduction to Practice

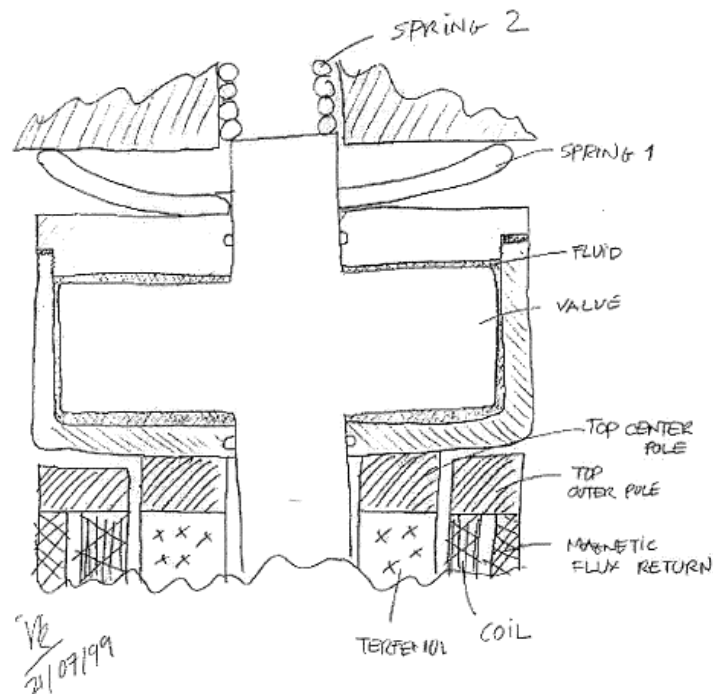
An inventor “may date his patentable invention back to the time of its conception, if he connects the conception with its reduction to practice by reasonable diligence on his part, so that they are substantially one continuous act.” *Mahurkar v. C.R. Bard, Inc.*, 79 F.3d 1572, 1577 (Fed. Cir. 1996). “Conception must be proved

by corroborating evidence which shows that the inventor disclosed to others his completed thought expressed in such clear terms as to enable those skilled in the art to make the invention.” *Coleman v. Dines*, 754 F.2d 353, 359 (Fed. Cir. 1985).

The invention claimed in the '138 Patent (the “hydraulic link” concept) was initially conceived as part of the development of Westport’s J40 injector as part of a project for a major automobile manufacturer client. See Ex. 2002 at ¶¶ 7-10, Ex. 2005². In July 1999, Westport informed their client that Westport had selected the “hydraulic link” concept as the design on which to proceed with detailed engineering, prototyping and testing. Ex. 2005 at 6-8. Sketches of the “hydraulic link” concept provided to Westport’s client in July 1999 include the following:

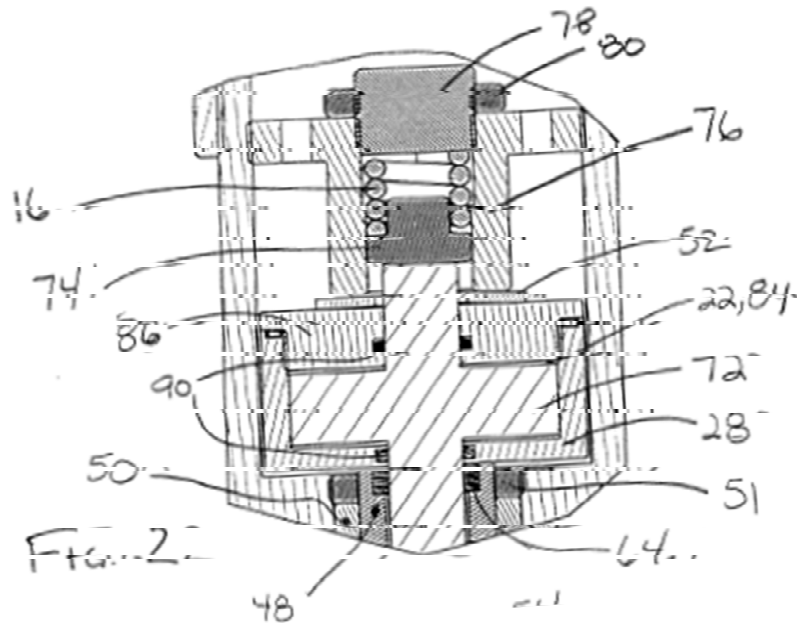
² Mercedes was provided a copy Ex. 2005 as part of Westport’s document production in the Texas Litigation.

Hydraulic Link Design



Id. The text provided with the figure above explains that a “valve shoulder or piston is buried in a hydraulic fluid inside a hydraulic chamber.” *Id.* at 6. As an upward-acting actuation force is applied to the hydraulic chamber, “the fluid under the valve will behave as a solid so that it will transfer the force to the valve.” *Id.* A “viscous liquid” is used to increase the “stiffness” of the system since it can not flow quickly from one side of the shoulder or piston through the gap between the piston and the hydraulic chamber wall (which is 250 microns or less). *Id.* When the valve is seated (closed), the fluid will “slowly adjust itself to accommodate thermal elongation” and “readjust to the proper zero position.” *Id.* at 7.

Detailed design of the J40 prototype continued through the finalization and release of manufacturing drawings in October 1999. Ex. 2002 at 17-23, Ex. 2007. For the detailed design to be considered substantially complete and drawings released for production, detailed engineering calculations, numerical simulations, 3-D modeling, and selected sub-component testing would have been completed. Ex. 2002 at 17, Ex. 2006. The '791 Provisional was filed on October 15, 1999 with the following figure illustrating the hydraulic link:



Ex. 1007 at Figure 2. As described in the '791 Provisional:

The hydraulic link 22 consists of a hydraulic cavity 84 formed by a hydraulic chamber 28 and a hydraulic chamber cap 86. The cavity 84 is filled with a viscous fluid. Within the chamber 28 is located the hydraulic piston part 72 of the needle valve 14. The chamber 28 is fitted around the hydraulic piston 72. O-ring seals 90 are located in the hydraulic chamber cap 86 and in the bottom of the hydraulic chamber

28 to prevent the fluid from leaking out of the cavity 84. The diametrical clearance between the outside diameter of the hydraulic piston 72 and the inside diameter of the hydraulic chamber 28 is extremely small (on the order of 50 to 250 microns).

Ex. 1007 at 13. In operation, “the hydraulic fluid . . . does not have the time to flow around the piston 72 . . . and instead acts as a solid and transmits the movement of the magnetostrictive material 40 to the needle valve 14, causing it to lift against the needle spring 16.” *Id.* at 14. The ’791 Provisional further explains that viscous fluid moves from one side to the other side of the piston to accommodate thermal elongation and that the hydraulic chamber 28 will move to re-zero itself when the injector is closed. *See id.*

Following the inventors’ approval and release of detailed engineering drawings in October 1999, component parts were manufactured. Ex. 2002 at 23-26. A prototype of the J40 injector with a hydraulic link was assembled and successfully tested on February 10, 2000. Ex. 2009. Within one month, on March 9, 2000, Westport filed the ’130 Application, which included a detailed specification spanning 43 pages and including 5 figures, such as the figure below illustrating the hydraulic link:

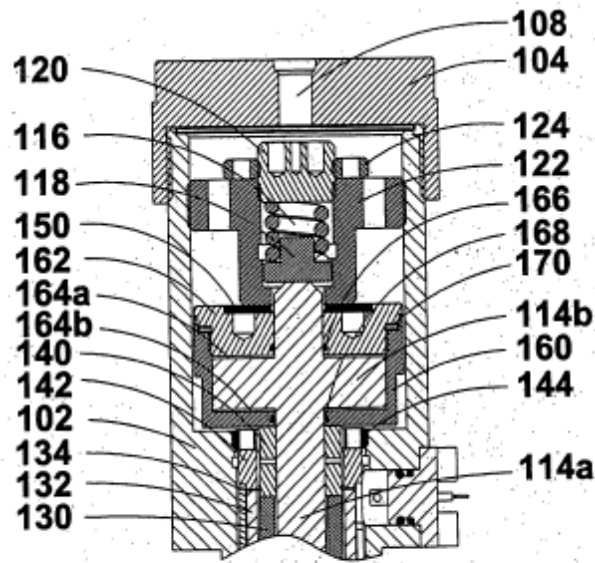


Figure 2

Reduction to practice requires sufficient testing “to demonstrate that [the invention] will work for its intended purpose, but it need not be in a commercially satisfactory stage of development.” *Scott v. Finney*, 34 F.3d 1058, 1062, 32 USPQ2d 1115, 1118-19 (Fed. Cir. 1994); *EZ Dock v. Schafer Sys., Inc.*, 276 F.3d 1347, 1351 (Fed. Cir. 2002). The adequacy of an actual reduction to practice is determined by whether a POSITA would have understood the invention would work for its intended purpose. See *Winter v. Lebourg*, 394 F.2d 575, 581 (C.C.P.A. 1968). An invention can be considered reduced to practice even though it is later refined or improved. *Atlanta Attachment Co. v. Leggett & Platt, Inc.*, 516 F.3d 1361, 1367 (Fed. Cir. 2008).

The evidence establishes that Westport conceived of the claimed invention by July 1999, when it was reported in detail to Westport's collaborator. Westport exhibited reasonably continuous diligence in reducing the invention to practice through an actual reduction to practice no later than February 10, 2000. Westport has submitted evidence of successful prototype testing in February 2000. Ex. 2009. Westport's evidence of a successful actual reduction to practice is further supported by numerous entries in contemporaneous inventor notebooks that were produced to Mercedes as part of the Texas Litigation. If Mercedes' petition is instituted, Westport would produce and rely upon those notebooks here in further support of its successful actual reduction to practice.

The Board, however, does not need to reach the question of whether Westport's evidence is in fact sufficient to demonstrate an actual reduction to practice in order to deny institution. Here Mercedes does not dispute that Westport's filing of the '130 Application in March 2000 established a constructive reduction to practice of the claimed subject matter. Pet. at 17. Whether using an actual reduction to practice date of February 10, 2000 or a constructive reduction to practice date of March 9, 2000, the evidence clearly shows that Westport conceived of the claimed invention before the critical date of Gottlieb (November 24, 1999) and exhibited

reasonably continuous diligence in reducing the invention to practice. Therefore Gottlieb cannot qualify as prior art under pre-AIA 35 U.S.C. §102(e)(2).

2(b). Westport is Entitled to Claim Priority to the '791 Provisional Filing Date.

While Westport contends that the filing of the '130 Application constitutes a constructive reduction to practice and that it was reasonably diligent from the date of conception through the filing of the '130 Application, the filing of the '791 Provisional demonstrates an even earlier constructive reduction to practice (thus narrowing the period during which Westport would have to show reasonable diligence). In other words, Gottlieb also would not constitute prior art to the '829 Patent under pre-AIA 35 U.S.C. §102(e)(2) if the '791 Provisional is considered a constructive reduction to practice. A provisional application acts as a constructive reduction to practice when the provisional application contains “a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.” Pre-AIA 35 U.S.C. §112, first paragraph.

Mercedes contends that “the Provisional does not have the same disclosure as the '138, so there should be no presumption that the '138 is entitled to the

Provisional's filing date . . . [t]hus, patent owner bears the burden to show that identified limitations are supported by the provisional application." Pet. at 17-18, citing *SK Hynix Inc. v. Netlist, Inc.*, IPR2020-01044 (PTAB Dec. 17, 2020) Paper 13 at 23-24. Mercedes, however, conveniently disregards the sentence in *SK Hynix*, which states, before shifting that burden to the patent owner: "we require Petitioner to first identify with specificity the limitations of the ['138] patent claims that it asserts lack written description support in the Provisional." *SK Hynix* at Paper 13 at 23-24. Mercedes' Petition fails to do so.

Mercedes appears to contend that the following limitation of Claim 1 lacks written description support in the '791 Provision: "hydraulic fluid thickness . . . with said thickness being **substantially constant** while said actuator assembly is activated and wherein said thickness of said hydraulic link is adjustable while said actuator is not activated." Pet. at 18-19. Mercedes argues that during prosecution Westport "limited" the words "substantially constant" within hydraulic link term in two ways: to mean an "incompressible solid," Pet. at 18-20, and to "define that the fluid is specifically confined between two things," Pet. at 20. It is these alleged "limitations" that Mercedes contends are not supported by the written description of the '791 Provisional. Westport disagrees with Mercedes' attempt to limit the claims in these ways, as discussed further below. In addition, the alleged "limitations" are

nothing more than Mercedes’ theoretical—but unasserted—claim construction arguments and are *not* actual claim limitations. Notably, Mercedes does not seek a construction of “substantially constant” that includes these two alleged requirements in its Petition. Pet. at 23. And, notably, no other party to date—including Westport—has proposed a construction of “substantially constant” consistent with Mercedes’ positions during the Texas Litigation. This argument is a strawman wherein Mercedes reads non-existent requirements into the claim limitation and then complains that those non-existent requirements are not supported in the ’791 Provisional.³

The written description requirement focuses on whether the invention as claimed was disclosed in the earlier specification. *PowerOasis, Inc. v. T-Mobile USA, Inc.*, 522 F.3d 1299, 1306 (Fed. Cir. 2008) (the written description in a provisional must “actually or inherently disclose the **claim element**” of the non-provisional application) (emphasis added). As the Board quoted in *SK Hynix*, “the

³ Mercedes makes other “prosecution definition” arguments that should be rejected for similar reasons. *See, e.g.*, Pet. at 20-21 (“‘[P]assive hydraulic link,’ which was explicitly defined during prosecution as ...the language of this definition was added in the Non-provisional and was not present in the Provisional.”).

test [of whether a provisional describes the claimed invention] requires an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art.” *SK Hynix* at 24 (quoting *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc)). Notably, neither Mercedes nor its expert ever argue or suggest that a POSITA would not have recognized that the inventors of the ’138 Patent were in possession of the invention at the time the provisional was filed.

Mercedes identify certain words or phrases that are found in the claims but not in the provisional application and conclude that, since the claims include words not found recited verbatim in the provisional application, the claims are not supported by the provisional. Pet at 18-23. There is no requirement, however, that the exact same words be used to satisfy the written description requirement. *Ex parte O’Sullivan*, No. 2018-001684, 2018 Pat. App. LEXIS 8231, *10 (P.T.A.B. Oct. 1, 2018) (“[T]he provisional need not contain precisely the same words as [the asserted claims] to satisfy the written description requirement.”); *Eiselstein v. Frank*, 52 F.3d 1035, 1038, 34 U.S.P.Q.2D (BNA) 1467, 1470 (Fed. Cir. 1995) (same). Similarly, Dr. Bower’s declaration echoes the statements in the Petition and provides his opinion that “numerous claim elements are not referenced anywhere in the provisional, and are thus not supported . . . by the Provisional.” Ex. 1002 at 54. Dr.

Bower never alleges that a POSITA would not have understood that the inventors of the '138 Patent were in possession of the invention claimed in the patent based on the disclosure of the provisional.

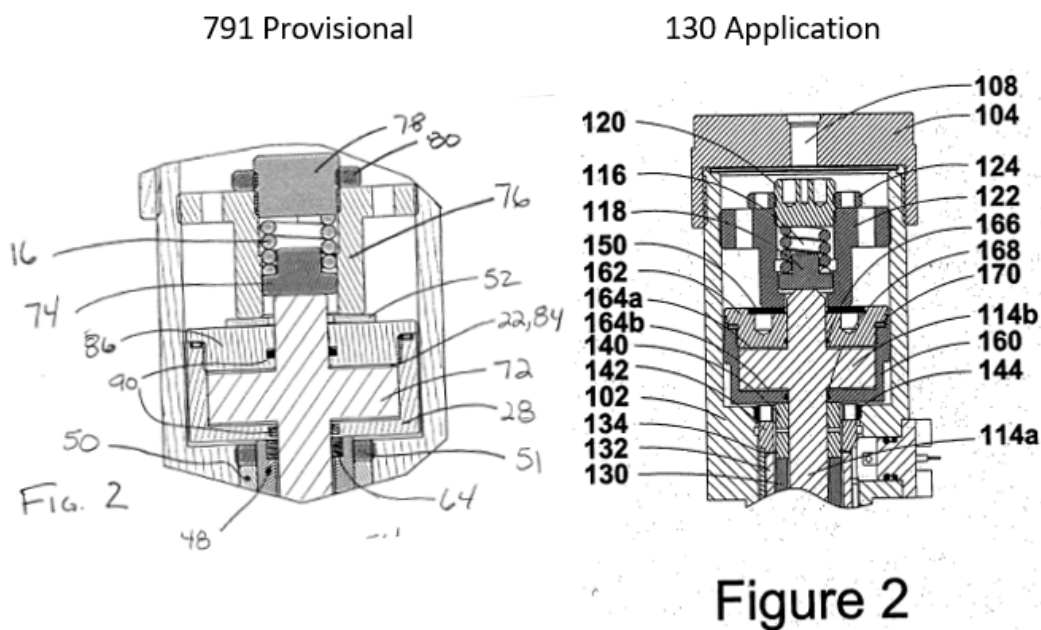
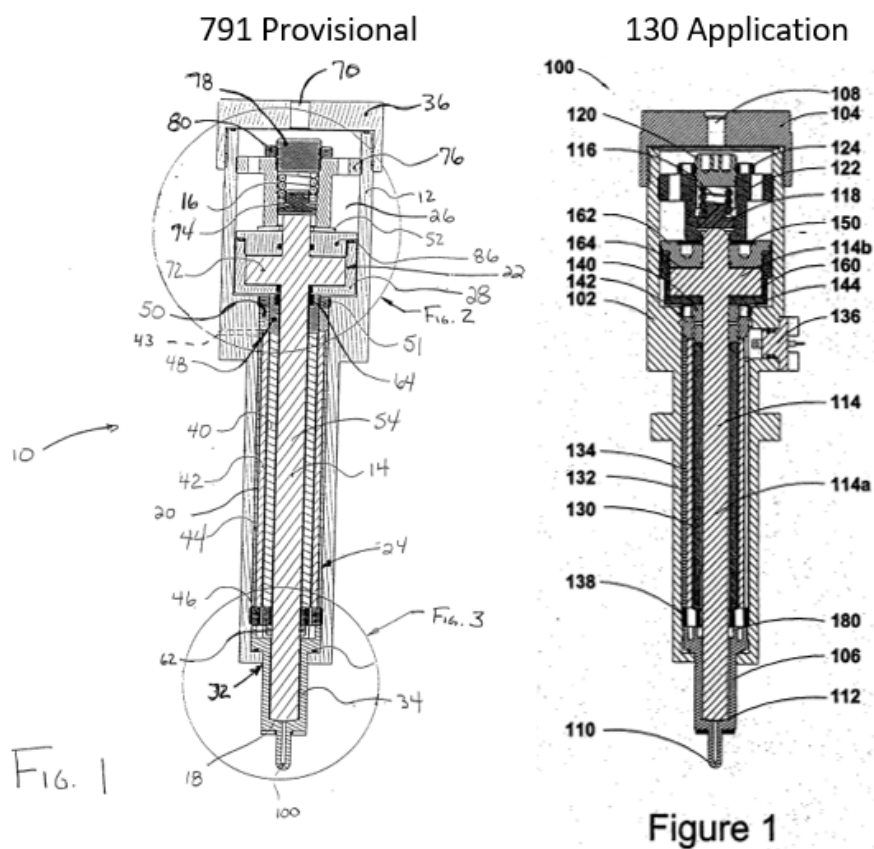
In fact, here, the '791 Provisional provides the requisite support for Claim 1's hydraulic link limitation. *See, e.g.*, '791 Provisional at p. 11, ll. 13 - p.13, ll. 4⁴; *id.* at p. 12, ll. 15-17 ("The hydraulic fluid, which should be chosen to be quite viscous, acts as a solid during fast motions, because there is little flow going around the needle piston."). The '791 Provisional teaches:

Because the actuation occurs suddenly (on the order of 200 μ s), the hydraulic fluid between the hydraulic chamber 28 and the needle valve piston 72 does not have the time to flow around the piston 72. Instead, the trapped fluid acts as a solid and transmits the movement of the magnetostrictive material 40 to the needle valve 14, causing it to lift against the needle spring 16. Because the injector stays open for such a brief period (a few milliseconds) it does not have time to allow the chamber 28 to move significantly relative to the valve 14.

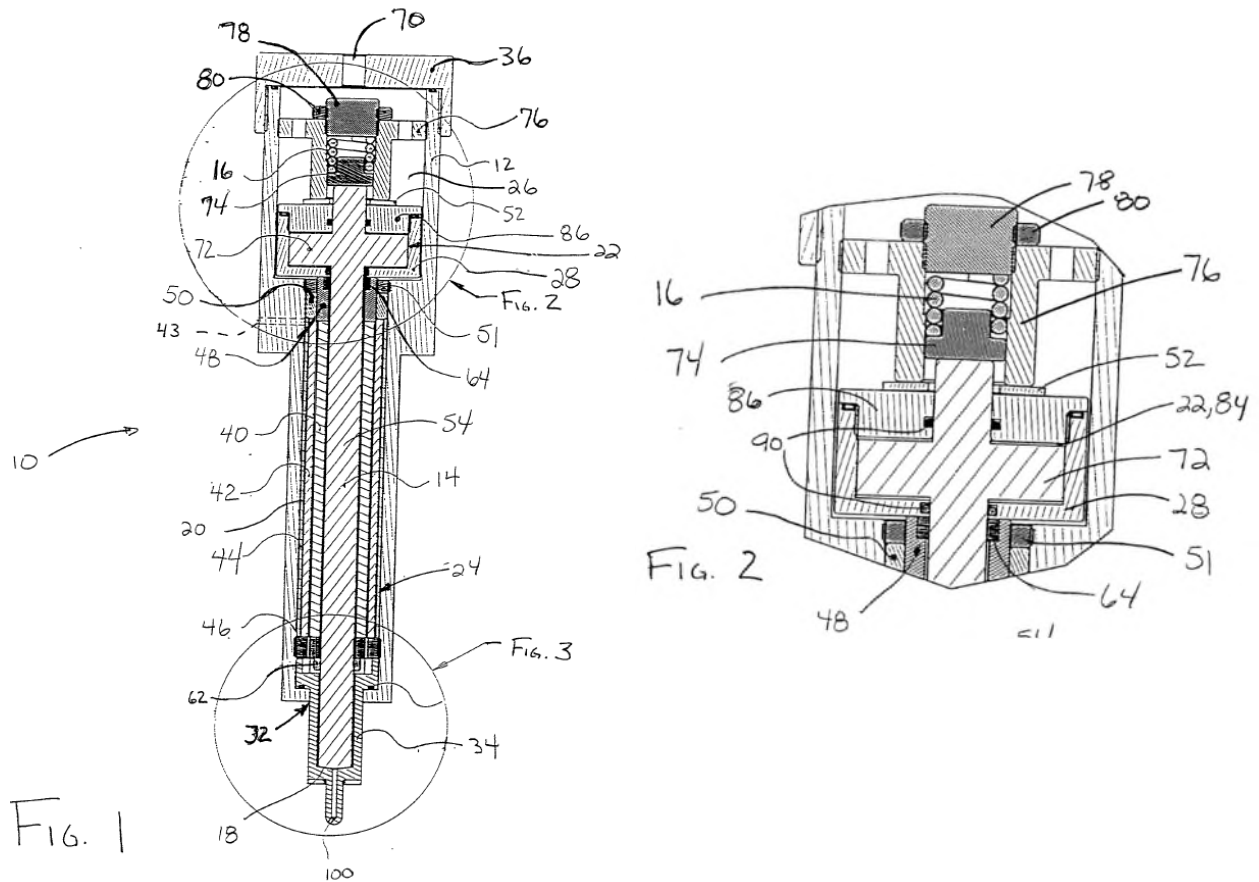
Id. at p. 13, ll. 9-16.

⁴ The page and line numbers used in citations to the '791 Provisional are the page numbers from the provisional filing. They page numbers from EX1007 are one page higher than the pages from the provisional filing due to the provisional filing cover sheet.

Although **not** discussed in the Petition or in the related expert declaration (Ex. 1002 ¶¶ 54-58), the '791 Provisional also disclosed very detailed figures. Ex. 1007 at pg. 19-20. Drawings alone may provide an adequate “written description” of an invention. *Lockwood v. Amer. Airlines, Inc.*, 107 F.3d 1565, 1572 (Fed. Cir. 1997) (An applicant shows that the inventor was in possession of the claimed invention by describing the claimed invention with all of its limitations using such descriptive means as words, structures, figures, diagrams, and formulas that fully set forth the claimed invention); *In re Skvorecz*, 580 F.3d 1262 (Fed. Cir. 2009) (finding that a person of ordinary skill in the art would understand that the drawings disclosed mechanical functionality not described in the specification). Even a cursory comparison between the figures of the '791 Provisional and the '130 Application shows that the two applications disclose identical mechanical structures.



Further, in reference to Figs. 1 and 2, the '791 Provisional discloses the hydraulic link 22 as having a “hydraulic cavity 84 formed by a hydraulic chamber 28 and a hydraulic chamber cap 86” and that the hydraulic cavity contains “a viscous fluid.” Ex. 1007 at 12:5-7. A hydraulic piston 72 is located within the chamber 28 with an “extremely small” diametrical clearance between the piston and the chamber. *Id.* at 12:7-13. The hydraulic flow in this clearance is governed by Hagen-Poiseuille Flow and is also “very small.” *Id.* at 12:13-15. “During the injection event, a small amount of hydraulic fluid may leak from one side of the hydraulic piston to the other.” *Id.* at 14:15-16. A spring 52 applies a pre-load to the hydraulic chamber 28 that causes the hydraulic assembly to “auto-adjust itself for differences in part lengths and wear.” *Id.* at 12:20 to 13:3 (emphasis added). The '791 Provisional further explains that while the injector is not actuated, in order to “accommodate thermal elongation, the fluid inside the hydraulic chamber 28 leaks from one side to the other.” *Id.* at 14:11-14. It also explains that when the injector is closed “there is enough time for the chamber to “re-zero” itself” and that “the zero position may vary depending on the actual temperature of the components of the injection valve.” *Id.* at 14:22 to 15:5.



Taking into consideration the above teachings, a POSITA would have understood that a **“hydraulic fluid thickness”** exists as a fluid layer between the piston 72 and the chamber 28 as is illustrated in Figs. 1 and 2 and as taught by ’791 Provisional at 12:8-10. Ex. 2003 at ¶16-17. Because the viscous fluid is disclosed as acting as a solid to transmit actuation force but that a small movements may occur as governed by Hagen-Poiseuille Flow equation, a POSITA would have understood that the hydraulic fluid layer (thickness) is **“substantially constant while said actuator assembly is activated”** and acts **“substantially as a solid.”** *Id.* at ¶18.

Because the '791 Provisional teaches that fluid will leak from one side to the other when the actuator is not actuated, a POSITA would have understood that the “thickness of said hydraulic link is adjustable while said actuator is not activated.” *Id.* at ¶19.

Petitioner’s reliance on *Research Corp.* is also misplaced. In *Research Corp.* the specification in the relied-upon applications repeatedly referred to a “blue noise mask” as being “the present invention.” *Id.* at 871. The court found that the references to the term “present invention” strongly suggested that the invention claimed in the applications was limited to a blue noise mask. *Id.* at 872. Therefore, the court reasoned that the asserted claims, which claimed masks *without* blue noise characteristics, were not entitled to priority to the earlier applications. *Id.* The case here is distinguishable because the '791 Provisional does not have language indicating that the present invention is specifically limited to hydraulic fluid that acts only as a solid, and Mercedes does not request such a construction of this term. The '791 Provisional expressly states that the hydraulic fluid chosen should be “quite viscous” and that it “acts as a solid . . . because there is little flow.” Ex.1007 at 12:15-17. Unlike *Research Corp.*, there is written description support for the claim term “substantially as a solid” based on the above disclosures in the '791 Provisional.

Because a POSITA, when considering the entirety of the teachings of the '791 Provisional would have understood that the inventors were in full possession of the invention claimed in the '138 Patent as of the filing date of the '791 Provisional, the '791 Provisional serves as a constructive reduction to practice (entitling the '138 Patent to claim the priority date of the '791 Provisional), prior to the critical date of Gottlieb. Therefore, Gottlieb is not prior art to the '138 Patent under pre-AIA 35 U.S.C. §102(e).

As the evidence presented shows, the invention claimed in the '138 Patent was conceived prior to the critical date of Gottlieb (November 24, 1999) AND was either:

- (i) actually reduced to practice following Westport's reasonable continuous diligence in reducing the invention to practice between the date of conception until the successful prototype test in February 2000;
- (ii) actually reduced to practice following Westport's reasonable continuous diligence in reducing the invention to practice between the date of conception until the filing of the '130 Application in March 2000; or
- (iii) constructively reduced to practice prior to the critical date by filing of the '791 Provisional in October 1999, from which a POSITA would

have understood that the inventors were in full possession of the invention claimed in the '138 Patent, and entitling the '138 Patent to claim priority to the filing date of the '791 Provisional.

Because of any of these facts, Gottlieb is not prior art to the '138 Patent under pre-AIA 35 U.S.C. §102(e) (or any other provision of pre-AIA 35 U.S.C. §102). As both grounds 1a and 1b rely on Gottlieb, and Gottlieb is not prior art under pre-AIA 35 U.S.C. §102, Petitioner has failed to establish any likelihood of prevailing on any ground and the request for *inter partes* review must be denied.

B. GOTTLIEB (DE)

The Petition does not explain under which portion of pre-AIA 35 U.S.C. §102 Mercedes believes Gottlieb (DE) is prior art.

Gottlieb (DE) was filed in Germany on August 8, 1998 and was published in Germany on March 9, 2000. Ex. 1005/1006, pg. 1. Although not relevant to the availability of Gottlieb (DE) as prior art, the Petition and Dr. Bower both identify that Gottlieb “claims priority” and is a “foreign equivalent” to Gottlieb (DE).⁵ Pet. 57, 58, 60, Ex. 1002 at ¶¶ 102, 104 and 106. This is factually untrue as even a cursory

⁵ Page 23 of the Petition correctly identifies that Gottlieb claims priority to DE19854506.

review of the face of Gottlieb shows that Gottlieb claims priority to DE 19854506 (blue oval) and Gottlieb (DE) (DE 19838862) (red oval) is listed on the face of Gottlieb but as a reference cited. Ex. 1004, pg. 1 (annotated below).

(12) United States Patent Gottlieb et al.	(10) Patent No.: US 6,530,273 B1 (45) Date of Patent: Mar. 11, 2003
(54) METERING DEVICE AND METHOD FOR DELIVERING FLUID EMPLOYING A COMPENSATING ELEMENT (75) Inventors: Bernhard Gottlieb, Munich (DE); Hans Meixner, Munich (DE); Andrea Kappel, Brunnthal (DE); Randolf Mock, Munich (DE) (73) Assignee: Siemens Aktiengesellschaft (DE) (*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days. (21) Appl. No.: 09/449,084 (22) Filed: Nov. 24, 1999 (30) Foreign Application Priority Data Nov. 25, 1998 (DE) 198 54 506 (51) Int. Cl.⁷ G01F 15/06; B67D 3/00; B05B 1/08; F16K 31/02 (52) U.S. Cl. 73/272 R; 239/102.2; 239/88; 239/533.2; 251/129.06; 222/504; 222/509; 222/518 (58) Field of Search 73/272 R, 262, 73/271, 272, 274; 222/504, 509, 518; 251/129.06; 239/102.2, 88, 95, 96, 533.2	(56) References Cited U.S. PATENT DOCUMENTS 5,897,554 A * 12/1997 Auwaerter et al. 239/88 FOREIGN PATENT DOCUMENTS DE 198 38 862 A1 3/2000 * cited by examiner <i>Primary Examiner</i>—Hezron Williams <i>Assistant Examiner</i>—C. Dickens (74) Attorney, Agent, or Firm—Baker Botts LLP (57) ABSTRACT A metering device and method for delivering fluid that employs a compensating element. The metering device has a housing defining a fluid chamber that contains a pressurized fluid. The housing further encloses an actuating drive, a valve needle and a compensating element. The housing terminates at a housing opening for delivery of fluid to the outside of the housing. Fluid is delivered from the housing by moving the actuating drive which in turn displaces the valve needle in an opening direction. Upon displacement of the valve needle, the valve needle moves axially in the opening direction with little, if any, lift loss due to the compensating element. The compensating element further acts to compensate for shifting or movement of metering components due to external factors, such as varying thermal loads, aging effects, and settling effects. 20 Claims, 2 Drawing Sheets

1) Pre-AIA 35 U.S.C. §102(a)

Pre-AIA §102(a) covers material “patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for patent.” Pre-AIA 35 U.S.C. §102(a).

The earliest date of publication, and thus the critical date, of Gottlieb (DE) was March 9, 2000. Ex. 1005/1006, pg. 1. As discussed above, the date of invention of the '138 Patent is at least as early as July 1999. Even Mercedes does not dispute that the '138 Patent is at least entitled to a date of invention of the filing date of the '130 Application, which was March 9, 2000. Pet. at 16.

Because Gottlieb (DE) was not published prior to March 9, 2000, it is not prior art under pre-AIA 35 U.S.C. §102(a).

2) Pre-AIA 35 U.S.C. §102(b)

Pre-AIA §102(b) covers material “patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States.” Pre-AIA 35 U.S.C. §102(b).

The earliest date of publication, and thus the critical date, of Gottlieb (DE) was March 9, 2000. Ex. 1005/1006, pg. 1. The '130 Application was filed on March 9, 2000 and the '791 Provisional was filed on October 15, 1999.

Because Gottlieb (DE) was not published more than one year prior to the filing date of the '130 Application or the '791 Provisional, Gottlieb (DE) is not prior art under Pre-AIA 35 U.S.C. §102(b).

3) Pre-AIA 35 U.S.C. §102(e)(1)

Under pre-AIA 35 U.S.C. §102 (e)(1), “[a] person shall be entitled to a patent unless - the invention was described in — (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent.” Gottlieb (DE) was not published under section 122(b) so is not prior art under pre-AIA 35 U.S.C. §102 (e)(1).

4) Pre-AIA 35 U.S.C. §102(e)(2)

Under pre-AIA §102 (e)(2), “[a] person shall be entitled to a patent unless - the invention was described in . . . (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent.”

Gottlieb (DE) is not an application for patent filed in the United States so it does not qualify as prior art under pre-AIA §102 (e)(2).

Because Gottlieb (DE) does not qualify as prior art to the ’138 Patent under any provision of pre-AIA 35 U.S.C. §102, any grounds raised in this petition based on Gottlieb (DE) are without merit. As grounds 1b relies on Gottlieb (DE), and Gottlieb (DE) is not prior art under pre-AIA 35 U.S.C. §102, Petitioner has failed to establish any likelihood of prevailing on any ground and the request for *inter partes* review must be denied.

VI. Real Parties-in-Interest

The petition is required to identify all real parties-in-interest. 35 U.S.C. §312(a)(2). The PTAB Trial Practice Guide informs that the core functions of this requirement are to assist the Board with identifying conflicts and to assure application of statutory estoppel provisions.

The petition identified Mercedes-Benz USA, LLC, Mercedes-Benz Intellectual Property GmbH & Co. KG, Mercedes-Benz AG, and Robert Bosch LLC as real parties-in-interest.

Patent Owner notes that in the petition from the 293 IPR, the parties listed above were named as real parties-in-interest but Robert Bosch GmbH, Ford Motor Company, and General Motors LLC were also named as real parties-in-interest.

It stands to reason that if Robert Bosch GmbH, Ford Motor Company, and General Motors LLC were real parties-in-interest with Mercedes in the 293 IPR, they are likely real parties-in-interest in the present IPR.

Should the Board institute the present IPR, Patent Owner intends to request discovery on this issue in order to determine whether the petition is fully compliant with 35 U.S.C. §312(a)(2).

VII. Conclusion

For the reasons set forth above, Westport requests that institution be denied.

Dated: March 23, 2023

Respectfully submitted,

By: /Derek V. Forinash/

Derek V. Forinash (Reg. No. 47,231)
Miranda Y. Jones (Reg. No. 64,721)
PORTER HEDGES LLP
Attorneys for Westport Fuel Systems
Canada, Inc.

CERTIFICATE OF SERVICE

The undersigned certifies that the foregoing Patent Owner Preliminary Response, together with all exhibits and other documents filed therewith, was served on the Petitioner's counsel of record by email (to which Petitioner has consented) to:

celine.crowson@hoganlovells.com

joseph.raffetto@hoganlovells.com

ryan.stephenson@hoganlovells.com

scott.hughes@hoganlovells.com

Dated: March 23, 2023

Respectfully submitted,

By: /Derek V. Forinash/

Derek V. Forinash (Reg. No. 47,231)
Miranda Y. Jones (Reg. No. 64,721)
PORTER HEDGES LLP
Attorneys for Westport Fuel Systems
Canada, Inc.

CERTIFICATE OF WORD COUNT

The undersigned certifies that the foregoing Patent Owner Preliminary Response, exclusive of the parts exempted by 37 C.F.R. § 42.24, contains 6298 words, according to the word processing program used to prepare it, and therefore complies with the limitations of 37 C.F.R. § 42.24.

Dated: March 23, 2023

Respectfully submitted,

By: /Derek V. Forinash/

Derek V. Forinash (Reg. No. 47,231)
Miranda Y. Jones (Reg. No. 64,721)
PORTER HEDGES LLP
Attorneys for Westport Fuel Systems
Canada, Inc.