

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MWE INVESTMENTS, LLC,
HARBOR FREIGHT TOOLS USA, INC., and
GENERAC POWER SYSTEMS, INC.,
Petitioners

v.

CHAMPION POWER EQUIPMENT, INC.,
Patent Owner.

U.S. Patent No. 11,530,654

Title: OFF-BOARD FUEL REGULATOR FOR GENERATOR ENGINE

Inter Partes Review No. IPR2025-01423

**PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 11,530,654**

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LIST OF EXHIBITS

Exhibit	Description
1001	U.S. Patent No. 11,530,654 (“’654 Patent”)
1002	File History of U.S. Patent No. 11,530,654 (“’654 File History”)
1003	Declaration of Mahdi Shahbakhti (“Decl.”)
1004	DuroMax XP4400EH Operator’s Manual (“DuroMax”)
1005	U.S. Patent No. 5,718,265 to Elsdon (“Elsdon”)
1006	U.S. Patent No. 4,492,207 to Hallberg (“Hallberg”)
1007	U.S. Patent Publication No. 2011/0100335 A1 to Parlatore (“Parlatore”)
1008	Tri-Fuel YouTube Video (https://www.youtube.com/watch?v=DpknaAPTQ9U) (“Tri-Fuel Video”)
1009	LP-Gas Code Handbook, Eighth Edition, Lemoff, Theodore C., (2008) (excerpted) (“LP-Gas Handbook”).
1010	Indian Patent No. 207333 (“Chaudhari”) (certified)
1011	Application Details for Indian Patent No. 207333 (Chaudhari)
1012	<i>American Heritage Dictionary of the English Language</i> (3d ed. 1996) (excerpted)
1013	Declaration of Mr. John Ley re Tri-Fuel Video
1014	Declaration of Mr. Jared Bennett re Tri-Fuel Video
1015	Excerpts of File History for U.S. Patent No. 10,221,780 (“’780 File History”).
1016	Champion’s Claim Construction Brief in 23-cv-2371-PHX-DWL

1017	Declaration of David Raskin (dated May 7, 2025)
1018	“Convert Blackmax 7000 Watt Generator to Propane and Natural Gas,” YouTube Video, posted October 11, 2013 (<i>available at</i> https://www.youtube.com/watch?v=Ip7ckWAZ3xQ)
1019	U.S. Patent No 1,931,698 to Holzapfel (“Holzapfel”)
1020	2-Stage Regulator Assembly (“2-Stage Assembly”) with WayBack Machine certification

CLAIM LIST

Claim 1	Claim Language
[1.0]	A dual fuel generator and fuel delivery system comprising:
[1.1]	a dual fuel generator configured to operate on a liquid fuel supplied from a liquid fuel source through a liquid fuel line and a gaseous fuel supplied from a pressurized fuel source through a gaseous fuel line;
[1.2]	a fuel regulator system located off board the dual fuel generator, the fuel regulator system comprising:
[1.3]	a primary pressure regulator coupled to a service valve of the pressurized fuel source and configured to regulate the fuel supplied from the pressurized fuel source to a reduced pressure; and
[1.4]	a secondary pressure regulator coupled to the primary pressure regulator and configured to regulate the gaseous fuel supplied from the primary pressure regulator to a desired pressure for delivery through the gaseous fuel line to operate the dual fuel generator;
[1.5]	a mechanical fuel valve actuatable between a first position and a second position to selectively control fuel flow to the dual fuel generator from the liquid fuel source through the liquid fuel line and the pressurized fuel source through the gaseous fuel line; and
[1.6]	a fuel lockout apparatus coupled to the mechanical fuel valve; and
[1.7]	wherein when the mechanical fuel valve is in the first position, the fuel lockout apparatus communicates the liquid fuel source to the dual fuel generator and prevents the pressurized fuel source from coupling to the dual fuel generator, and actuation of the mechanical fuel valve to the second position causes the fuel lockout apparatus to permit the pressurized fuel source to couple to the dual fuel generator, and interrupts the liquid fuel source communication with the dual fuel generator.
Claim 2	Claim Language
[2]	The dual fuel generator and fuel delivery system of claim 1, further comprising: a first end of a quick-connect hose coupling coupled to an

	outlet of the secondary pressure regulator; and a second end of the quick-connect hose coupling coupled to an inlet of the gaseous fuel line to mate with the first end of the quick-connect hose coupling to couple the secondary pressure regulator to the gaseous fuel line.
Claim 3	Claim Language
[3]	The dual fuel generator and fuel delivery system of claim 1, further comprising a regulator mounting device secured to the pressurized fuel source with at least the secondary pressure regulator mounted on the regulator mounting device.
Claim 4	Claim Language
[4]	The dual fuel generator and fuel delivery system of claim 3, wherein the primary pressure regulator is mounted on the regulator mounting device.
Claim 5	Claim Language
[5]	The dual fuel generator and fuel delivery system of claim 4, wherein the pressurized fuel source comprises a pressurized fuel container having a collar; and wherein the regulator mounting device secures to the collar so that the primary and secondary pressure regulators are positioned adjacent each other along an outer periphery of the collar.
Claim 6	Claim Language
[6.0]	A dual fuel generator and fuel delivery system comprising:
[6.1]	a dual fuel generator configured to operate on a liquid fuel supplied from a liquid fuel source through a liquid fuel line and a gaseous fuel supplied from a pressurized fuel source through a gaseous fuel line;
[6.2]	a fuel regulator system located off board the dual fuel generator, the fuel regulator system comprising:
[6.3]	a primary pressure regulator coupled to a service valve of the pressurized fuel source and configured to regulate the fuel supplied from the pressurized fuel source to a reduced pressure; and
[6.4]	a secondary pressure regulator coupled to the primary pressure regulator and configured to regulate the gaseous fuel supplied from the primary pressure regulator to a

	desired pressure for delivery through the gaseous fuel line to operate the dual fuel generator; and
[6.5]	a mechanical fuel valve actuatable between a first position and a second position to selectively control fuel flow to the dual fuel generator from the liquid fuel source through the liquid fuel line and the pressurized fuel source through the gaseous fuel line; and
[6.6]	wherein mechanical fuel valve opens and closes the liquid fuel line to selectively control fuel flow from the liquid fuel source to the dual fuel generator; and further comprises:
[6.7]	a fuel lockout apparatus coupled to the mechanical fuel valve and configured to prevent the pressurize fuel source from coupling to the gaseous fuel line while the mechanical fuel valve opens the liquid fuel line, and permit the pressurized fuel source to couple to the gaseous fuel line while the mechanical fuel valve closes the liquid fuel line.
Claim 7	Claim Language
[7]	The dual fuel generator and fuel delivery system of claim 6, wherein the fuel lockout apparatus is further configured to prevent the mechanical fuel valve from opening the liquid fuel line while the dual fuel generator receives fuel from the pressurized fuel source.
Claim 8	Claim Language
[8]	The dual fuel generator and fuel delivery system of claim 6, wherein the fuel lockout apparatus further comprises a fuel inlet cover that actuates with the mechanical fuel valve to cover an inlet of the gaseous fuel line while the mechanical fuel valve opens the liquid fuel line and to uncover the inlet of the gaseous fuel line when the mechanical fuel valve closes the liquid fuel line.
Claim 9	Claim Language
[9]	The dual fuel generator and fuel delivery system of claim 6, wherein the primary and secondary pressure regulators are integral components of a dual stage pressure regulator.
Claim 10	Claim Language

[10.0]	A generator and fuel delivery system comprising:
[10.1]	a generator configured to operate on a gaseous fuel supplied from a pressurized fuel source through a gaseous fuel line;
[10.2]	a fuel regulator system located off-board the generator, the fuel regulator system configured to:
[10.3]	regulate the gaseous fuel supplied from the pressurized fuel source in a first stage, the gaseous fuel regulated down to a reduced pressure in the first stage; and
[10.4]	regulate the reduced pressure gaseous fuel in a second stage, the reduced pressure gaseous fuel from the first stage regulated down to a desired pressure in the second stage for delivery through the gaseous fuel line to operate the generator; and
[10.5]	wherein the generator is free of any pressure regulator.
Claim 11	Claim Language
[11]	The generator and fuel delivery system of claim 10 wherein the first and second stages comprise a dual stage regulator configured to regulate the gaseous fuel supplied from the pressurized fuel source and regulate the reduced pressure gaseous fuel, wherein the dual stage regulator is mounted directly onto the pressurized fuel source, off-board from the generator.

I. STANDING AND RELIEF REQUESTED

MWE Investments, LLC, Harbor Freight Tools USA, Inc., and Generac Power Systems, Inc. (“Petitioners”) request *Inter Partes Review* (“IPR”) under 35 U.S.C. §§311–319 and 37 C.F.R. §42 of claims 1-11 of U.S. Patent No. 11,530,654 (“the ‘654 Patent”) based on the following grounds set forth.

Ground	Basis	Challenged Claims	Reference(s)
1	§103	1 and 3-11	DuroMax, Parlatore, and Elsdon
2	§103	1, 3-7, and 9-11	Hallberg and Parlatore
3	§102	10 and 11	Tri-Fuel Video
4	§102	10 and 11	Chaudhuri
5	§103	2	DuroMax, Parlatore, Elsdon, and LP-Gas Handbook, and alternatively, Hallberg, Parlatore, and LP-Gas Handbook

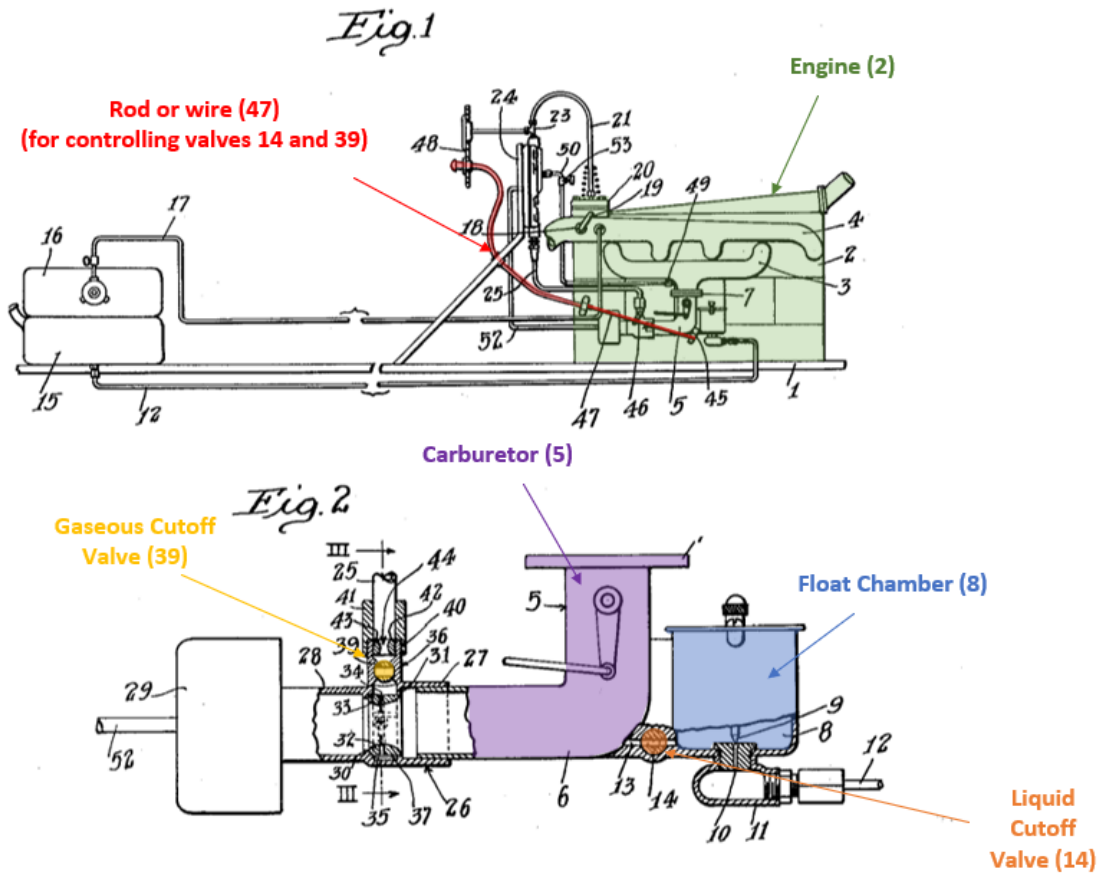
Petitioners certify that the ‘654 patent is available for IPR.

As explained herein, this Petition establishes a reasonable likelihood that Petitioners will prevail in showing that at least one of the challenged claims is unpatentable. Petitioners respectfully request that this IPR be instituted, and that Claims 1–11 be canceled as unpatentable.

II. STATE OF THE ART

A. Dual-Fuel Combustion Engines

Dual-fuel engines that run on liquid or gaseous fuel have been known in the art for many years. For example, Holzapfel, U.S. Patent No 1,931,698, was filed in 1931 and discloses “a fuel system embodying the supplying of liquid fuel and gaseous fuel to an engine in alternation at will.” Ex.1019, 1:1–5. The disclosed engine “provide[s] a fuel system...in which the liquid fuel supply may be cut off and the gaseous fuel supply turned on, or vice versa so that when the liquid fuel is employed the gaseous fuel is disconnected and while the gaseous fuel is employed the liquid fuel is disconnected.” *Id.*, 1:35–42. Holzapfel also discloses that a “rod or wire 47” is connected to gaseous and liquid cutoff valves to control both valves, as seen in Holzapfel’s Figs. 1-2 below:



Ex.1008, Figs. 1–2 (Annotated).

B. Dual-Stage Regulators

A pressure regulator is designed to control vapor pressure. Ex.1009, 118–119 (§5.8.1: “Propane appliances in buildings typically operate at 11 in. w.c. (2.7 kPa) (about 1/2 psi), so the vapor pressure of the propane in the container must be reduced to a much lower pressure for the appliance to operate safely.”). The same is true for outdoor appliances, such as portable generators and BBQ grills. These appliances rely on a propane tank for fuel where propane is stored as a liquid under a pressure of approximately 100 psi that must be reduced to a much lower pressure to operate properly. Ex.1009, [0054].

As noted in LP-Gas Handbook, the LP-Gas Code has definitions for the various types of regulators, including the first-stage regulators, second-stage regulators, and integral two-stage regulators referenced in the '654 Patent:

3.3.64.2 First-Stage Regulator. A pressure regulator for LP-Gas vapor service designed to reduce pressure from the container to 10.0 psig (69 kPag) or less.

3.3.64.3 High-Pressure Regulator. A pressure regulator for LP-Gas liquid or vapor service designed to reduce pressure from the container to a lower pressure in excess of 1.0 psig (6.9 kPag).

3.3.64.4 Integral 2 psi Service Regulator. A pressure regulator for LP-Gas vapor service that combines a high-pressure regulator and a 2 psi service regulator into a single unit.

3.3.64.5 Integral Two-Stage Regulator. A pressure regulator for LP-Gas vapor service that combines a high-pressure regulator and a second-stage regulator into a single unit.

3.3.64.6 Line Pressure Regulator. A pressure regulator in accordance with the *Standard for Line Pressure Regulators*, ANSI Z-21.80/CSA 6.22, with no integral overpressure protection device for LP-Gas vapor service designed for installation inside a building to reduce a nominal 2 psig inlet pressure to 14 in. w.c. (4.0 kPa) or less.

3.3.64.7 Second-Stage Regulator. A pressure regulator for LP-Gas vapor service designed to reduce first-stage regulator outlet pressure to 14 in. w.c. (4.0 kPag) or less.

3.3.64.8 Single-Stage Regulator. A pressure regulator for LP-Gas vapor service designed to reduce pressure from the container to 1.0 psig (6.9 kPag) or less.

3.3.64.9 2 psi Regulator System. An LP-Gas vapor delivery system that combines a first-stage regulator, a 2 psi (14 kPag) service regulator, and a line pressure regulator(s).

3.3.64.10 2 psi Service Regulator. A pressure regulator for LP-Gas vapor service designed to reduce first-stage regulator outlet pressure to a nominal 2 psig (14 kPag).

3.3.64.11 Two-Stage Regulator System. An LP-Gas vapor delivery system that combines a first-stage regulator and a second-stage regulator(s), or utilizes a separate integral two-stage regulator.

Ex.1009, 40–41 (§3.3.64) (annotated).

As described in LP-Gas Handbook, since 1995,

two-stage pressure regulation systems have been required for most fixed propane installations in buildings. The regulators used in two-stage regulator systems are designed to reduce propane container pressure to an intermediate pressure of 10

psig (69 kPag), and then further reduce pressure to 11 in. w.c. (2.7 kPag). This is accomplished with the use of two separate regulators (first- and second-stage), or with one single unit, an integral two-stage regulator.

Ex.1009, 118–119 (commentary regarding §5.8.1).

Although not strictly required for use outdoors, such as with generators and outdoor BBQ grills, using a two-stage pressure regulation system is advantageous because of its ability to maintain a constant outlet pressure, particularly as the inlet fuel pressure varies. Ex.1003, [0057].

As LP-Gas Handbook indicates, dual-stage regulators were well-known at the time of the invention. *Id.*, [0058]. For example, off-the-self dual-stage regulators were generally available at least by 2008, as shown below:



EXHIBIT 3.12 *Integral Two-Stage Regulator. (Courtesy of Engineered Controls International, Inc.)*

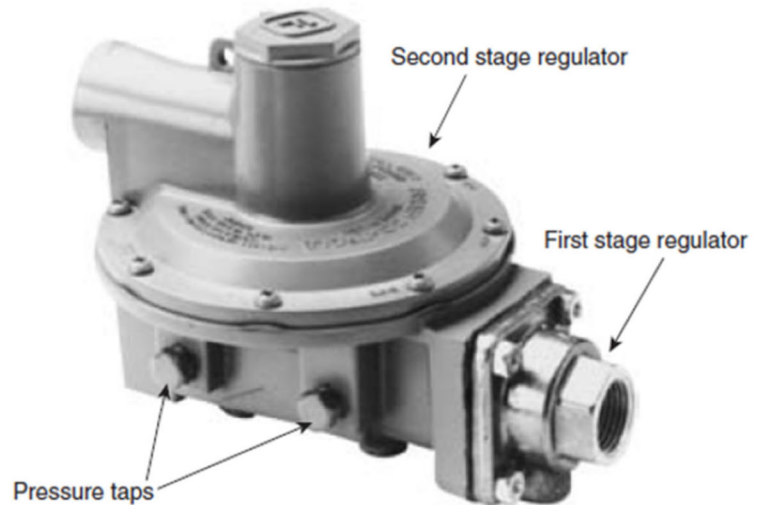


EXHIBIT 5.47 *Integral Two-Stage Regulator. (Courtesy of Fisher Controls Intl, LLC)*

Ex.1009, 41, 120 (published in 2008).



2-Stage Low Pressure Regulator Assembly

\$70.00 SKU: 106238

Add to Cart

Used for connecting commercial grade BBQ & Catering Grills requiring gas input in excess of 100,000 BTU's per hour to a propane tank via high volume green Type 1 tank connection. The green Type 1 allows a higher volume of gas to pass through the tank connection before going into bypass mode. *Standard Hose Length is 18" OAL [Learn More](#)

[Add to Wishlist](#) | [Add to Compare](#)



2-Stage Low Pressure Regulator Assembly with Stainless Steel Overbraid

\$90.00 SKU: 106221

Add to Cart

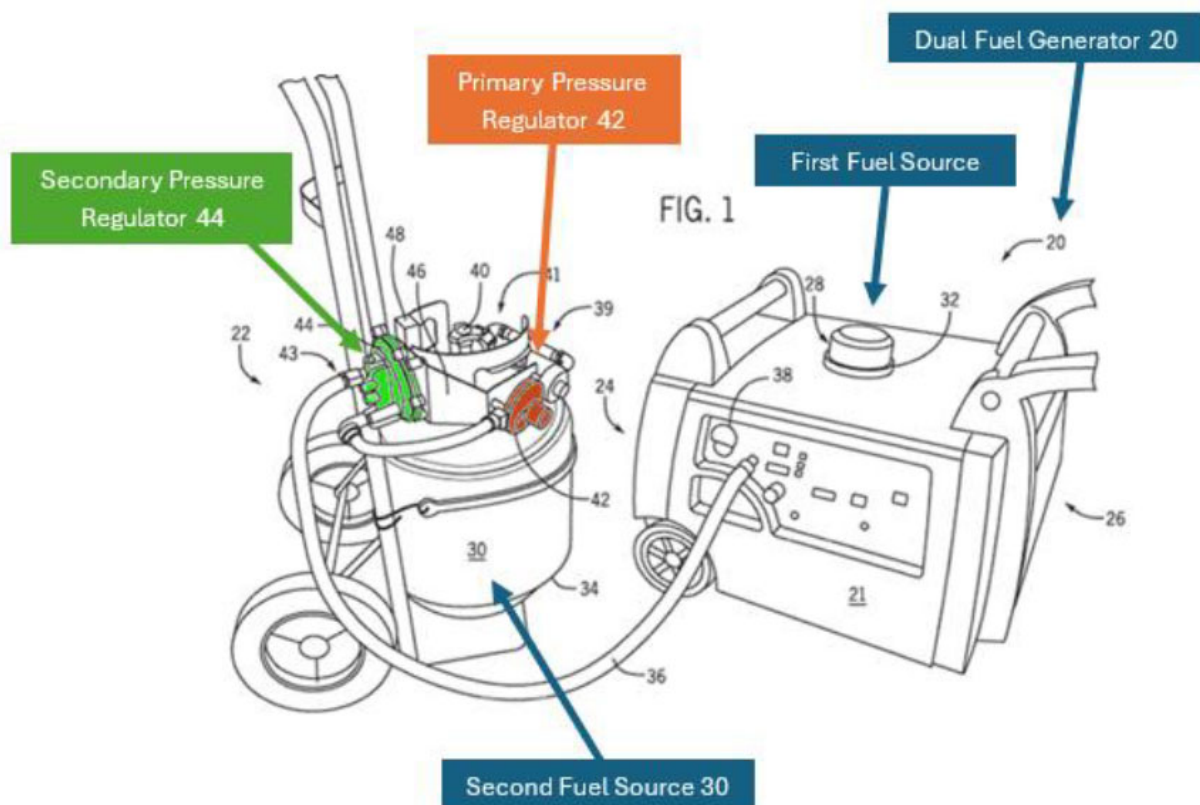
Stainless Steel Overbraided Two-Stage Regulator Assembly used for connecting commercial grade BBQ & Catering Grills requiring gas input in excess of 100,000 BTU's per hour to a propane tank via high volume green Type 1 tank connection. The green Type 1 allows a higher volume of gas to pass through the tank connection before going into bypass mode. The overbraid keeps small animals from damaging the hose. *Standard Hose Length is 18" OAL [Learn More](#)

[Add to Wishlist](#) | [Add to Compare](#)

Ex.1020 (webpage from 2013).

III. SUMMARY OF THE '654 PATENT

The '654 Patent is a continuation of U.S. Patent No. 10,221,780 (the "'780 Patent"), which was filed June 12, 2015. The '654 Patent is directed to supplying gaseous fuel to engines, including multi-fuel internal combustion engines and generators. Ex.1001, Abstract. The '654 Patent acknowledges that multi-fuel combustion engines typically run on liquid fuel (e.g., gasoline) and an alternative gaseous fuel (e.g., propane). *Id.*, 1:21–39. Figure 1 of the '654 Patent discloses a perspective view of a generator with such an engine, as shown below:



Ex.1001, Fig. 1 (Annotated).

The '654 Patent discloses a fuel regulator system “include[ing] one or more pressure regulators that reduce and control the pressure of the fuel from pressurized fuel container 34 and deliver[] fuel at a desired pressure for operation of the engine.” Ex.1001, 4:31-35. Fuel regulator system 39 includes “a primary pressure regulator 42 coupled to pressurized fuel container 34 and a secondary pressure regulator 44.” Ex.1001, 4:38-42. The primary pressure regulator “receives LPG through service valve 40 of pressurized fuel container 34 and reduces the pressure of the LPG to a first stage.” Ex.1001, 4:42-47. The secondary pressure regulator “receives LPG from primary pressure regulator 42 and further reduces the pressure of LPG to a second stage to be delivered to generator 20.” Ex.1001, 4:57-66. The secondary regulator may be located on the generator or “off-board the generator to reduce size and cost of the generator.” *Id.*, 4:50–59.

IV. LEVEL OF ORDINARY SKILL IN THE ART

A person of ordinary skill in the art (hereinafter “POSA”) would “be aware of all the pertinent prior art” at the time of the alleged invention (*Custom Accessories, Inc. v. Jeffrey-Allan Indus.*, 807 F.2d 955, 963 (Fed. Cir. 1986)), including specialized knowledge applicable to various aspects of the claimed

invention. *See, e.g., AVX Corp. v. Greatbatch, Ltd.*, IPR2014-00697, Paper 60 at 3 (P.T.A.B. Jan. 11, 2016). A POSA is also a person of ordinary creativity, not an automaton, and thus is able to make inferences from the art. *KSR Int'l Co. v. Teleflex*, 550 U.S. 398, 420-21 (2007).

For purposes of this Petition, a POSA as of June 12, 2015 (the filing date of the parent '780 Patent), would have at least a Bachelor of Science degree in mechanical engineering, physics, or related fields, and three years of work experience in combustion engines. Ex.1003, [0028]. Additional higher graduate education could substitute for work experience, and extensive experience/technical training could substitute for formal education. *Id.*

V. CLAIM CONSTRUCTION

Claims should be given their ordinary and customary meaning as understood by a POSA viewing the claim terms in the context of the entire patent. *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 8 (P.T.A.B. Aug. 24, 2022) (precedential).

Petitioners therefore propose the following claim constructions for certain claim terms. For the purpose of this Petition, no other terms in the Challenged Claims require construction. Petitioners reserve the right to respond to any constructions offered by the Patent Owner or adopted by the Board.

A. The Claimed “Fuel Lockout Apparatus”

Claims 1-9 of the '654 Patent require a “fuel lockout apparatus.” As explained below, the term “fuel lockout apparatus” is a means-plus-function claim term that covers the following corresponding structure and equivalents thereof: Items 58, 61 in Figs. 2, 3, 4A, 4B, as described at Ex.1001, 5:56–6:17; 6:29–50; 6:53–7:40; 8:49-9:8.¹

1. “Fuel Lockout Apparatus” Does Not Recite Any Structure and Therefore Invokes §112(f).

The term “fuel lockout apparatus” does not provide any structure corresponding to the function of providing fuel lockout and therefore invokes 35 U.S.C. §112(f).

Section 112(f) applies to claim terms that recite “function without reciting sufficient structure for performing that function.” *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1349 (Fed. Cir. 2015). The “critical question” in making this assessment “is whether the claim term is used in common parlance or by persons of skill in the pertinent art to designate structure.” *MTD Prods. Inc. v. Iancu*, 933 F.3d 1336, 1341 (Fed. Cir. 2019) (internal citations omitted). Generic terms such as “mechanism,” “element,” “device,” and other nonce words are tantamount to

¹ If this term is not treated as a means-plus-function limitation, it should be given the meaning that the Patentees chose for it, as clearly supported by the sole embodiment in the specification: “a moveable barrier capable of blocking physical access for attaching a fuel source to a fuel inlet on the second fuel line.”

using the word “means” because they “typically do not connote sufficiently definite structure” and therefore invoke Section 112(f). *Williamson*, 792 F.3d at 1350 (Fed. Cir. 2015). “Apparatus” is another example of a generic term that invokes §112(f). *See* MPEP §2181(I)(A).

Here, the phrase “fuel lockout apparatus” recites a function without providing any structure for performing that function. The phrase “fuel lockout apparatus” is not understood by POSAs to connote a specific structure. The claim merely replaces the term “means” with “apparatus.” The term “fuel lockout apparatus” has no independent meaning aside from “a means for providing fuel lockout.” The claim language fails to provide any structure for the “providing fuel lockout” function and is therefore subject to construction under §112(f).

2. The Corresponding Structure for “Fuel Lockout Apparatus”

The '654 Patent describes a single embodiment of a “fuel lockout apparatus.” In that embodiment, the “fuel lockout apparatus 58” is a “flange” that “is rigidly coupled to the rotating handle [56].” Ex.1001, 6:9-41. Fuel valve handle 56 is part of and controls mechanical fuel valve 54. *Id.* The flange “extends radially outward from fuel valve handle 56” and “sweeps over” the LPG fuel hose coupling “as the fuel valve handle 56 rotates.” *Id.* Based on the user selection, the flange “blocks off” or “uncovers” the “first end 50a of the quick-disconnect hose

coupling when fuel valve handle 56 is rotated” between the first and second positions. *Id.*, 7:19-28.

Specifically, when the fuel lockout apparatus is in the first position (selecting gasoline), the flange provides a barrier that extends over the fuel hose coupling 50a and prevents the user from coupling an LPG supply hose to the fuel hose coupling 50, thereby providing LPG fuel lockout. Ex.1001, 7:19-24; Figs. 2,4A.

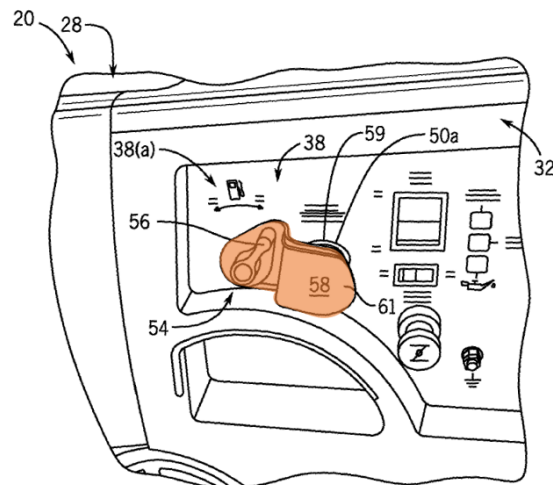


FIG. 2

Ex.1001, Fig. 2 (Annotated).

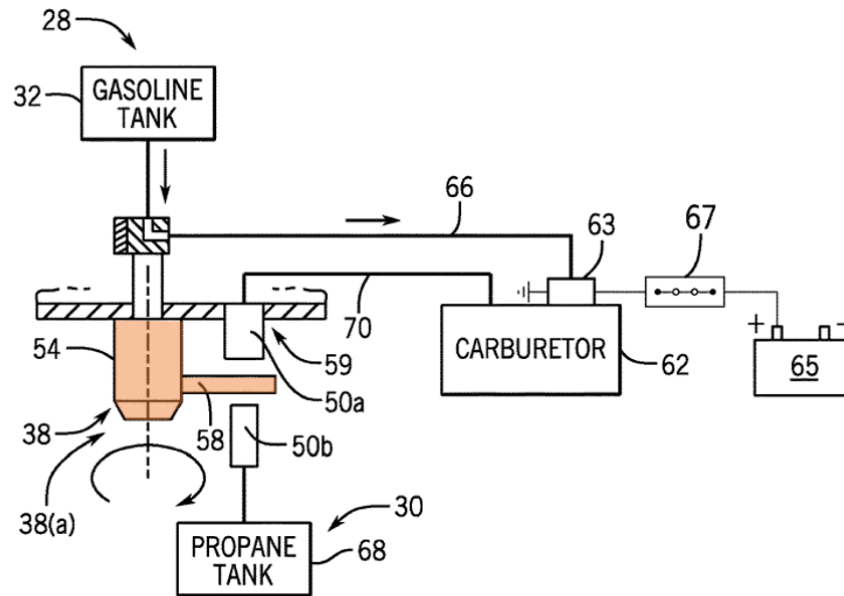


FIG. 4A

Ex.1001, Fig. 4A (Annotated).

When the fuel lockout apparatus is in the second position (selecting LPG), the fuel lockout apparatus prevents the user from selecting gasoline until the LPG supply hose is removed. Ex.1001, 7:24-33; Figs. 3,4B.

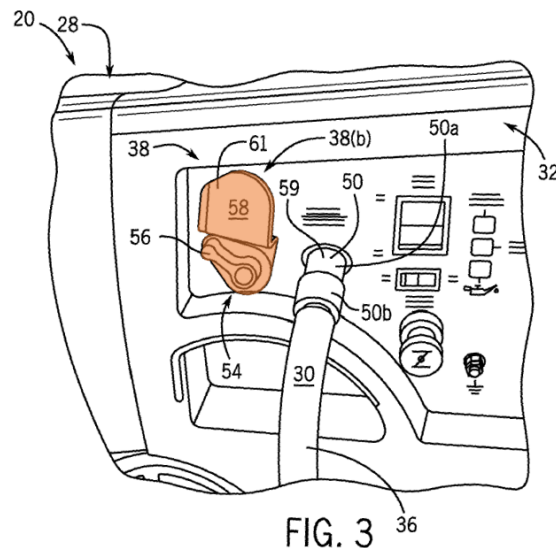


FIG. 3

Ex.1001, Fig. 3 (Annotated).

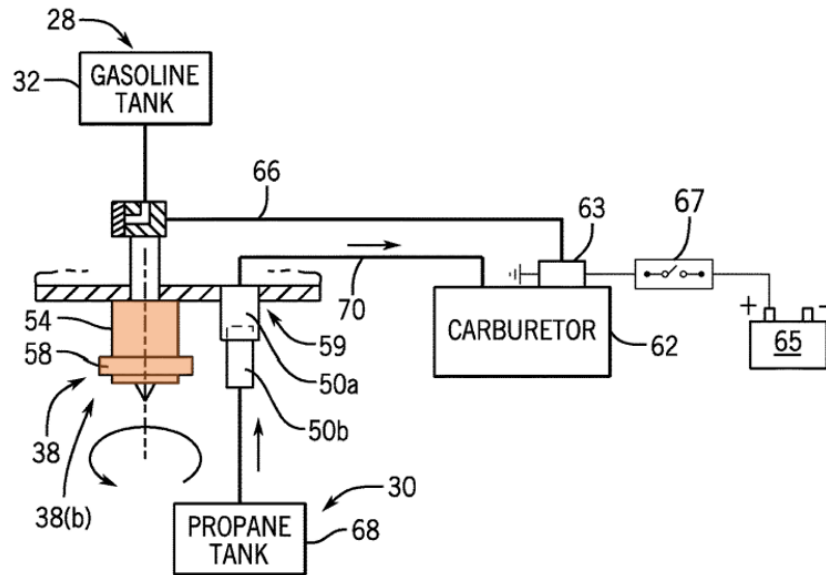


FIG. 4B

Ex.1001, Fig. 4B (Annotated)

The flange that extends radially outward from the valve handle and rotates with the valve handle over the fuel hose coupling provides both the gasoline and LPG lockout functionality. Thus, the proper structure corresponding to the “providing fuel lockout” functionality is: Items 58, 61 in Figs. 2, 3, 4A, 4B, as described at Ex.1001, 5:56–6:17; 6:29–50; 6:53–7:40; 8:49–9:8.

B. The Claimed Terms “Prevent...Coupling” and “Permit...to Couple”

Claim 1 of the '654 Patent recites:

wherein when the mechanical fuel valve is in the first position, the fuel lockout apparatus communicates the liquid fuel source to the dual fuel generator and **prevents** the pressurized fuel source from **coupling** to the dual fuel generator, and actuation of the mechanical fuel valve to the second position causes the fuel lockout apparatus to

permit the pressurized fuel source **to couple** to the dual fuel generator, and interrupts the liquid fuel source communication with the dual fuel generator.

The terms “coupling” and “to couple” refer to physically connecting or attaching two items. Ex.1003 [0132]; Ex.1011, p.4. As it was with the term “fuel lockout apparatus,” the specification of the ‘654 Patent is the best guide for ascertaining what a POSA would have understood the terms “prevents...coupling” and “permit...to couple” to mean.

The specification of the ‘654 Patent discloses only one way in which the fuel lockout apparatus “prevents...coupling” of the pressurized fuel source fuel source to the dual fuel generator: the “flange” (item 61) of the fuel lockout apparatus “block[s] fuel inlet 59 to prevent coupling the first end 50a and second end 50b of the quick-disconnect hose coupling together.” Ex.1001, 8:4-11; Figs. 2A,4A. Figs. 2 and 4A illustrate this:

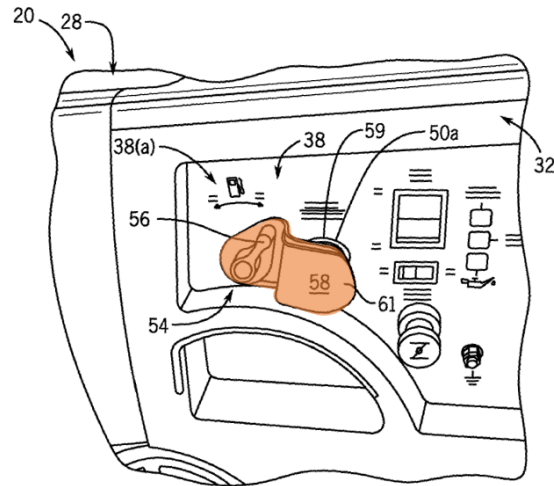


FIG. 2

Ex.1001, Fig. 2 (Annotated).

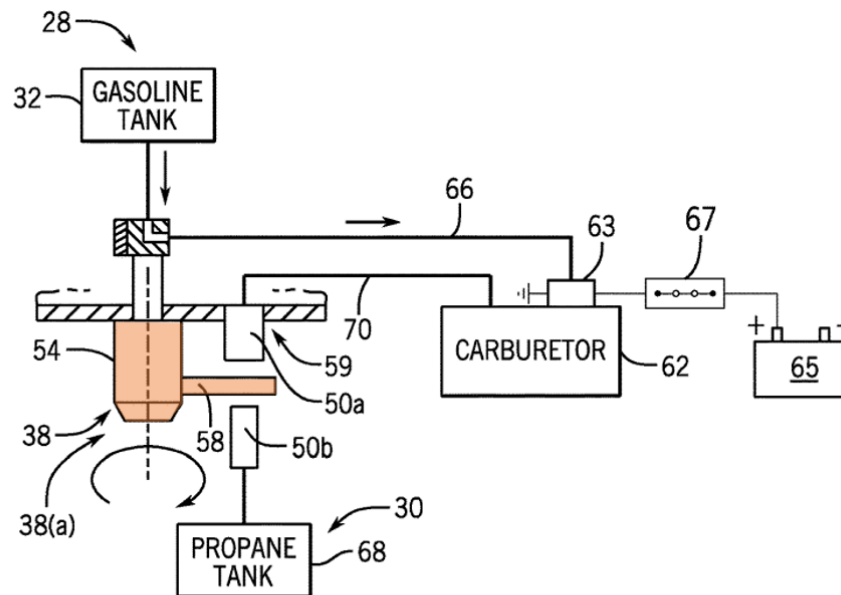


FIG. 4A

Ex.1001, Fig. 4A (Annotated).

The specification of the ‘654 Patent also discloses only one way in which the fuel lockout apparatus “permits” the pressurized fuel source “to couple” to the dual fuel generator: “fuel lockout apparatus 58 unblock[s] fuel inlet 59 to permit

attaching first end 50a and second end 50b together.” Ex.1001 8:5-11; Figs. 3,4B.

Figs. 3 and 4B illustrate this:

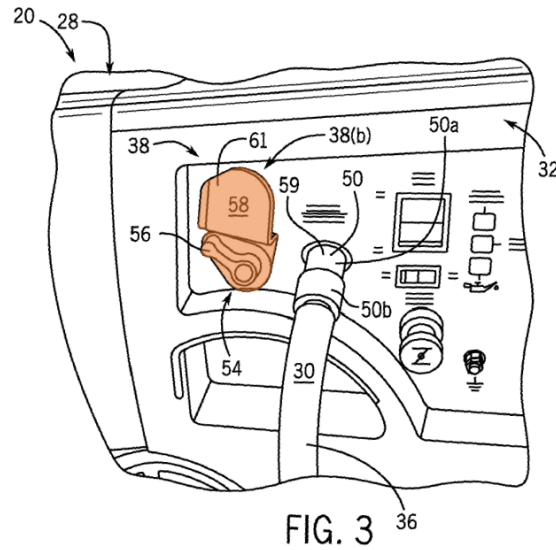


FIG. 3

Ex.1001, Fig. 3 (Annotated).

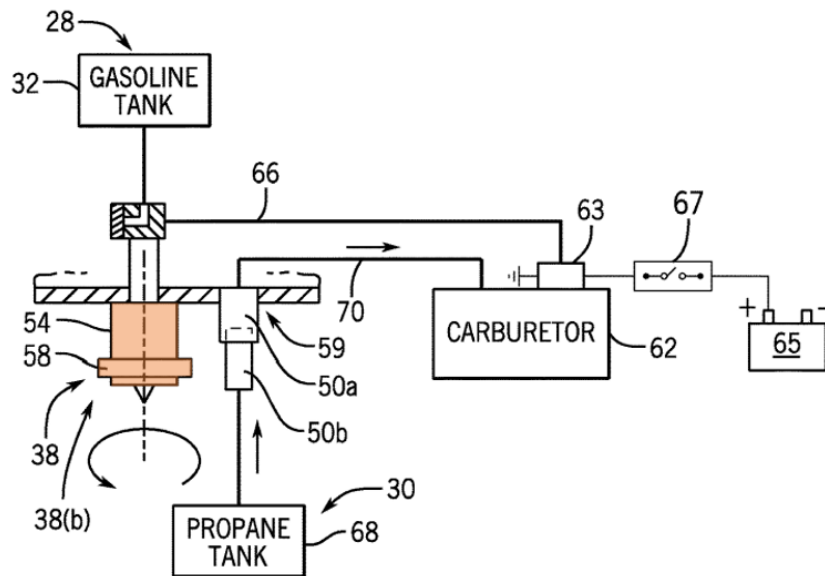


FIG. 4B

Ex.1001, Fig. 4B (Annotated)

The construction of “prevent...coupling” and “permit...to couple” to mean “prevent...attaching” and “permit...to attach” thus finds ample support in the specification of the ’654 Patent.

Moreover, during prosecution of the parent ’780 Patent, the Examiner stated that a dependent claim would be allowable if presented as an independent claim based on the understanding that the “fuel lockout apparatus **prevent[s] the second fuel source from coupling to the second fuel line...mean[ing] that not only are the two not in fluid communication but they are not physically connected in any manner**” (emphasis added). Ex.1015, p.160. In his reasoning, the Examiner stated that the prior art Champion Manual “discloses a dual fuel system as discussed...but its lockout switch **does not prevent the hose of the propane tank from even coupling to the engine fuel system lines**” (emphasis added). *Id.* The Examiner thus interpreted the term “coupling” to require not only “fluid communication,” but “physical[] connect[ion].”

Therefore, a POSA would have understood the terms “prevent...coupling” and “permit...to couple” to mean “prevent...attaching” and “permit...to attach,” respectively.

C. Patent Owner Has Construed “Fuel Lockout Apparatus,” “Prevent...Coupling,” and/or “Permit...to Couple” Incorrectly in the Related Litigations

Patent Owner filed multiple patent infringement lawsuits alleging that accused competitor products infringe at least claim 1 the '654 Patent. §VIII.B, *infra*. Based on Patent Owner's infringement allegations in the Related Litigations, Patent Owner appears to adopt a claim construction wherein (1) the “fuel lockout apparatus” can be any apparatus that prevents selection of more than one fuel source; (2) “prevent...coupling” can be any means to prevent fuel flow without necessarily preventing physical attachment of a fuel source to a fuel line; and (3) “permit...to couple” can be any means to permit fuel flow without necessarily permitting physical attachment of a fuel source to a fuel line. *See, e.g.*, Ex.1016, pp. 17,19.

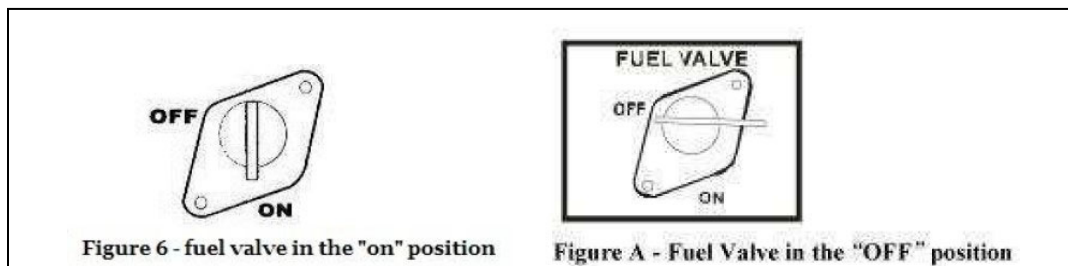
Patent Owner's apparent constructions are wrong, as explained above. However, Petitioners include an alternative position for claims 1, 3-7, and 9-11 in Ground 2, showing that claims 1, 3-7, and 9-11 are obvious even under Patent Owner's apparent constructions. In arguing in the alternative, Petitioners do not admit or concede that Patent Owner's apparent constructions are correct.

VI. OVERVIEW OF THE ASSERTED PRIOR ART

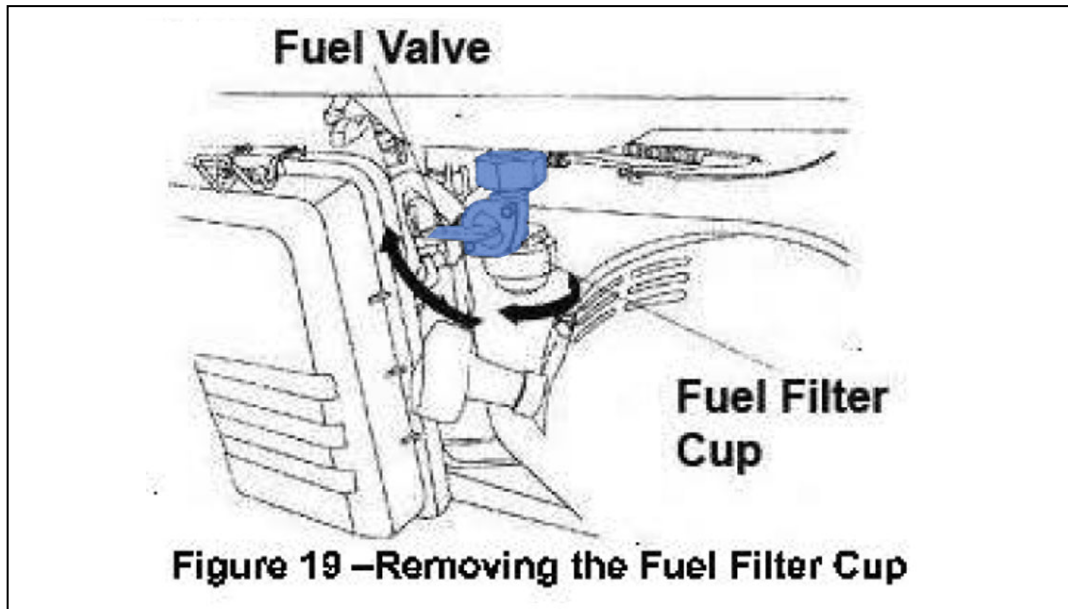
A. DuroMax

DuroMax was published/publicly available at least by November 1, 2012, before the filing date of the earliest application to which the '654 Patent claims priority. Ex.1017, ¶¶18-19. DuroMax is prior art to the '654 Patent under 35 U.S.C. §102(a).

DuroMax discloses the XP4400EH dual fuel generator—a dual fuel generator that runs alternatively on gasoline or liquefied petroleum gas (LPG). The generator includes a mechanical fuel shutoff valve having a valve handle.

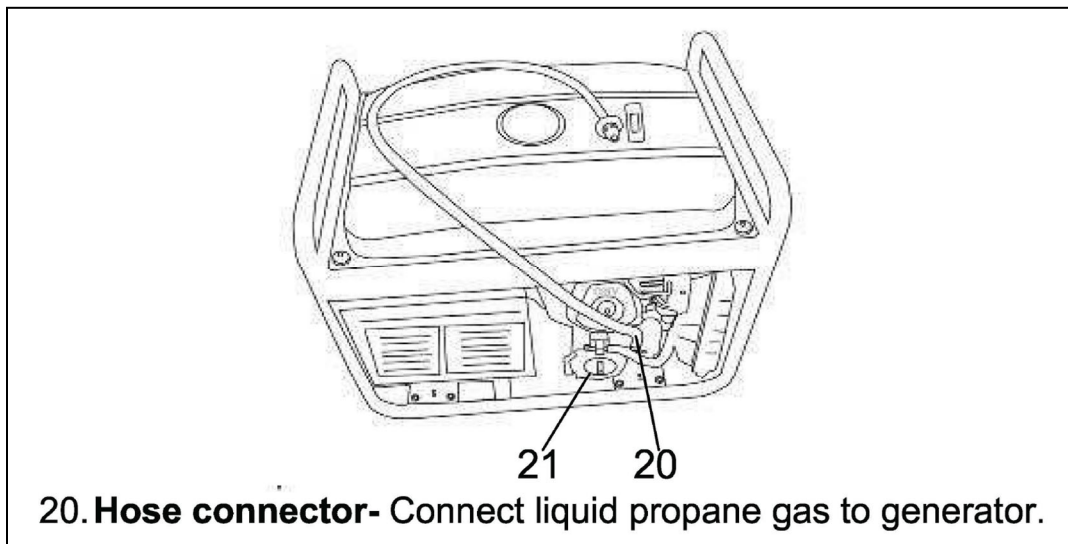


Ex.1004, pp.11,12.



Ex.1004, p.20 (Annotated).

The generator also includes an LPG fuel inlet.



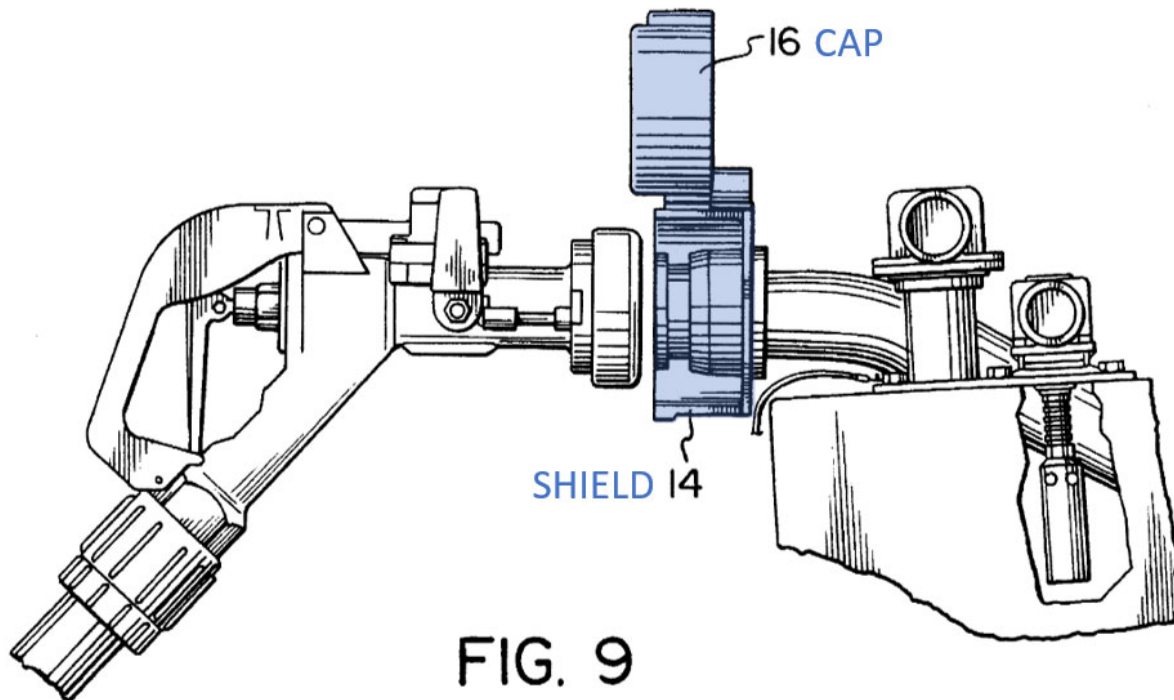
Ex.1004, p.7.

B. Elsdon

Elsdon was filed on February 24, 1995. Elsdon issued on February 17, 1998.

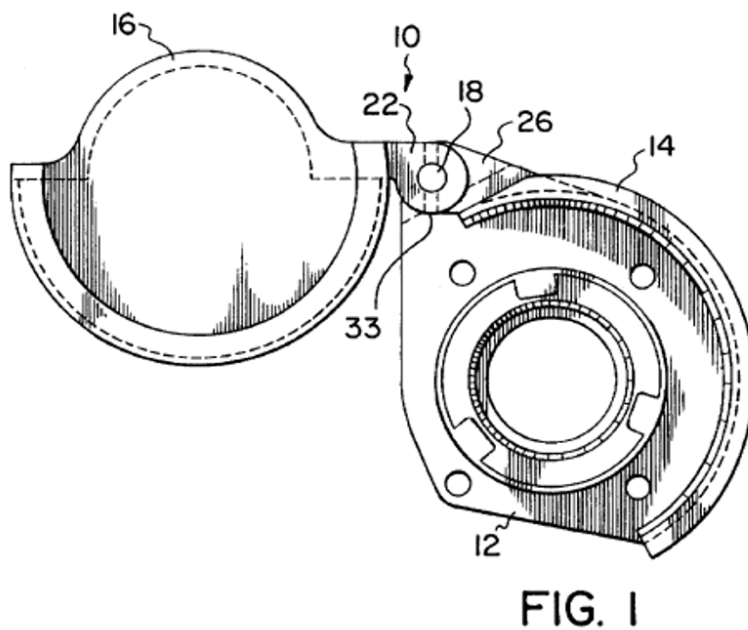
Elsdon is prior art to the '654 Patent under 35 U.S.C. §102(a).

Elsdon discloses an assembly having cap 16 and shield 14 assembly of a fluid conduit coupler 12 that is used for “flammable or other hazardous fluids, such as fuel...” Ex.1005, 1:10-13, 3:3-4, Fig. 9.

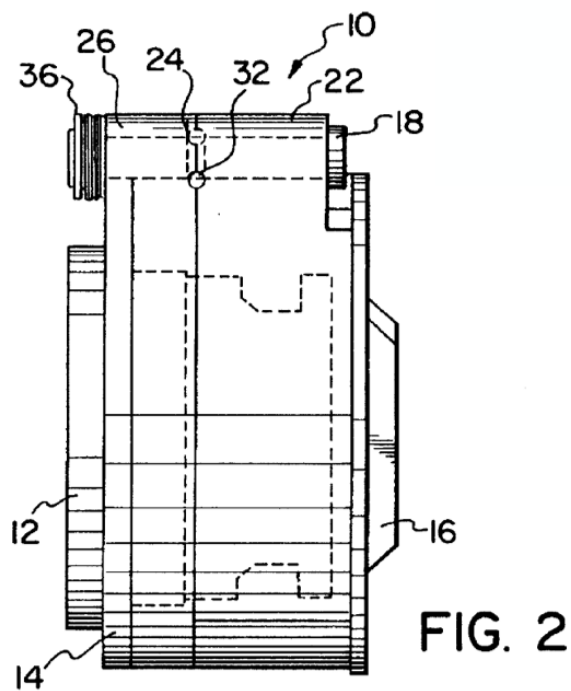


Ex.1005, Fig. 9 (Annotated).

Cap 16 is hingedly connected to shield 14 and is readily moveable between an open position (Fig. 9 above and Fig. 1 below) and a closed position (Fig. 2 below) in which cap 16 is positioned over the coupler 12 to prevent coupling with a fuel hose. *Id.*, 3:4-11.



Ex.1005, Fig. 1.



Ex.1005, Fig. 2.

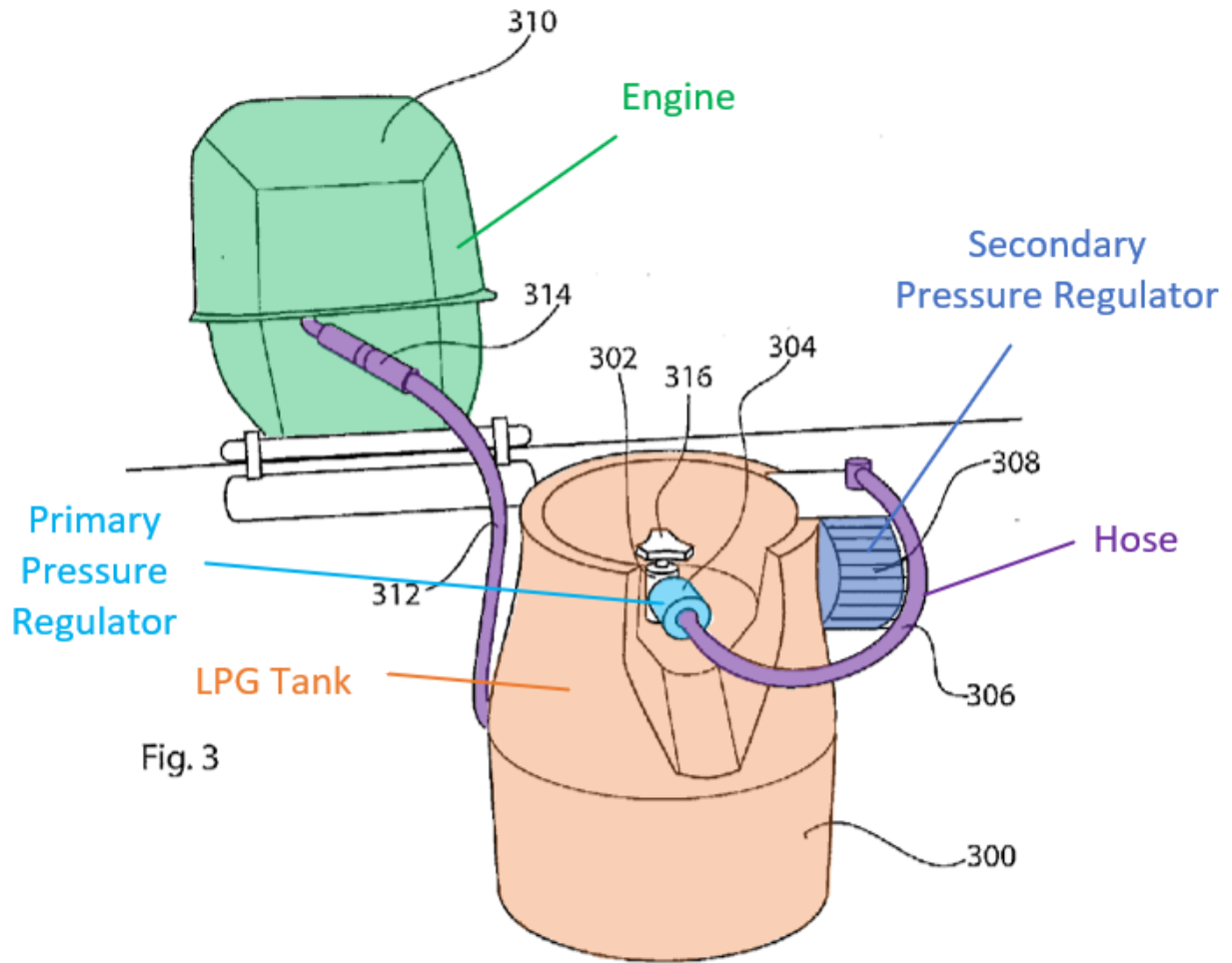
C. Parlature

Parlature was filed November 5, 2009, and published May 5, 2011. Parlature is prior art to the '654 Patent under 35 U.S.C. §102(a).

Parlature discloses a “method and system [having] one or more fuel storage tanks housing propane, one or more regulators through which fuel may flow and one or more fuel metering devices or systems.” Ex.1007, Abstract. Parlature discloses an LPG tank that may be connected to a primary regulator. *Id.*, [0016]. The primary regulator may step down pressure of any stored propane vapor energy in the LPG tank, and output the lowered pressure to a secondary regulator. *Id.* The secondary regulator can meter propane gas to an engine. *Id.*

The LPG tank may be connected to the primary regulator by a connector. *Id.*, [0020]. A low pressure output of the secondary regulator may be attached to a propane carburetor on an engine in any of a variety of manners (e.g., a hose and coupling). *Id.* A low pressure output of the secondary regulator may be attached to the propane carburetor either permanently or releasably. *Id.*

The primary and secondary fuel regulators are located off-board. Ex.1007, Fig. 3.



Ex.1007, Fig.3.

D. LP-Gas Code Handbook

LP-Gas Handbook was published/publicly available in 2008. Ex.1009, p.3. It is prior art under §102(a).

LP-Gas Handbook is the Eighth Edition in its series. Ex.1009, p.2. It is a commentary on the 2008 edition of NFPA® 58, *Liquefied Petroleum Gas Code*, (“LP-Gas Code”) and includes the full text of the code. *Id.*, pp.2, 24.

LP-Gas Handbook provides commentary on the definition for “Quick Connectors”:

3.3.62 Quick Connectors. Fittings used to connect hose assemblies to piping and valves without the use of tools.

Quick connectors are used to connect transfer hose to piping and valves for loading and unloading cargo tank vehicles or railroad tank cars. They can also be used as connectors on swivel-type transfer piping. Quick connectors are also used in other LP-Gas systems, such as those used for engine fuel refueling and cylinder filling, connecting cylinders to gas-fired barbecue grills, and connecting gas systems between two sections of mobile homes.

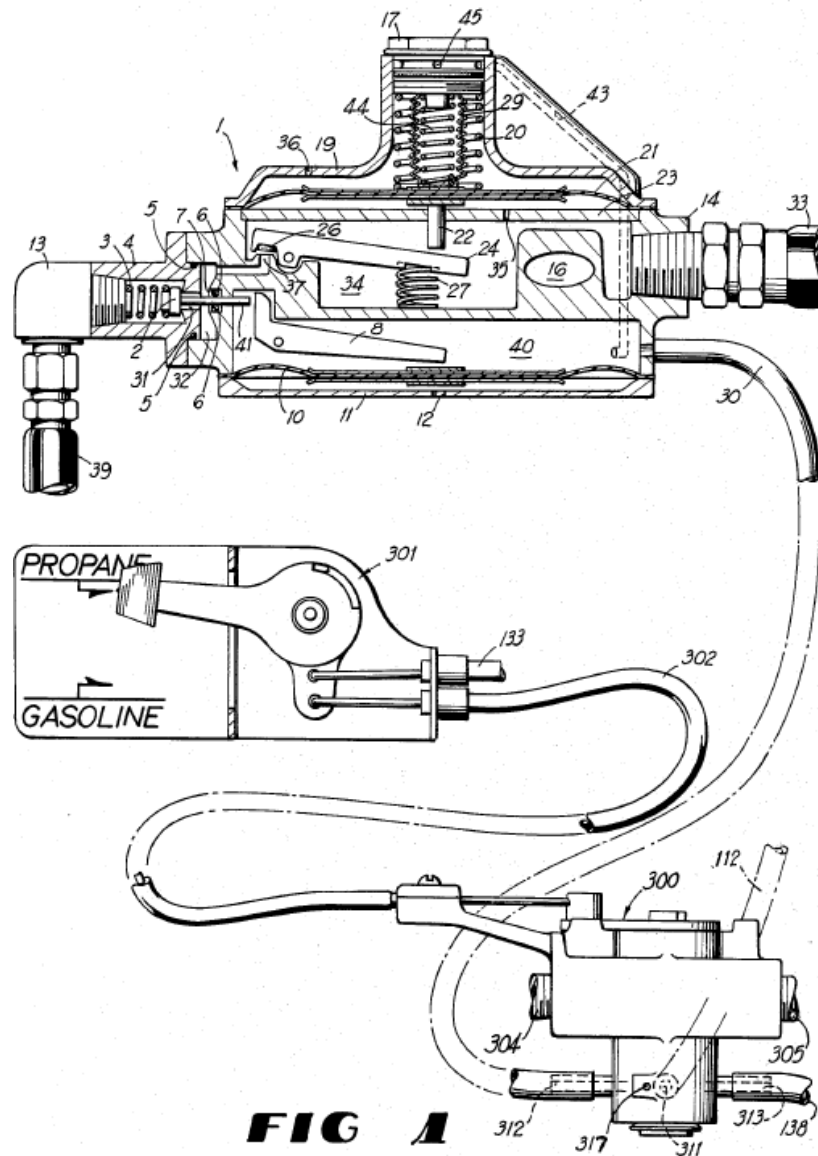
Ex.1009, p.40.

E. Hallberg

Hallberg was filed on February 27, 1981, and issued on January 8, 1985.

Hallberg is prior art to the '654 Patent under 35 U.S.C. §102(a).

Hallberg discloses a dual fuel system for use with internal combustion engines. Ex.1006, Abstract. Fuel to be utilized is selected by positioning fluid dual value control 301 in one of two positions, either “gasoline” or “propane.” Ex.1006, 7:27-29, Fig. 1.

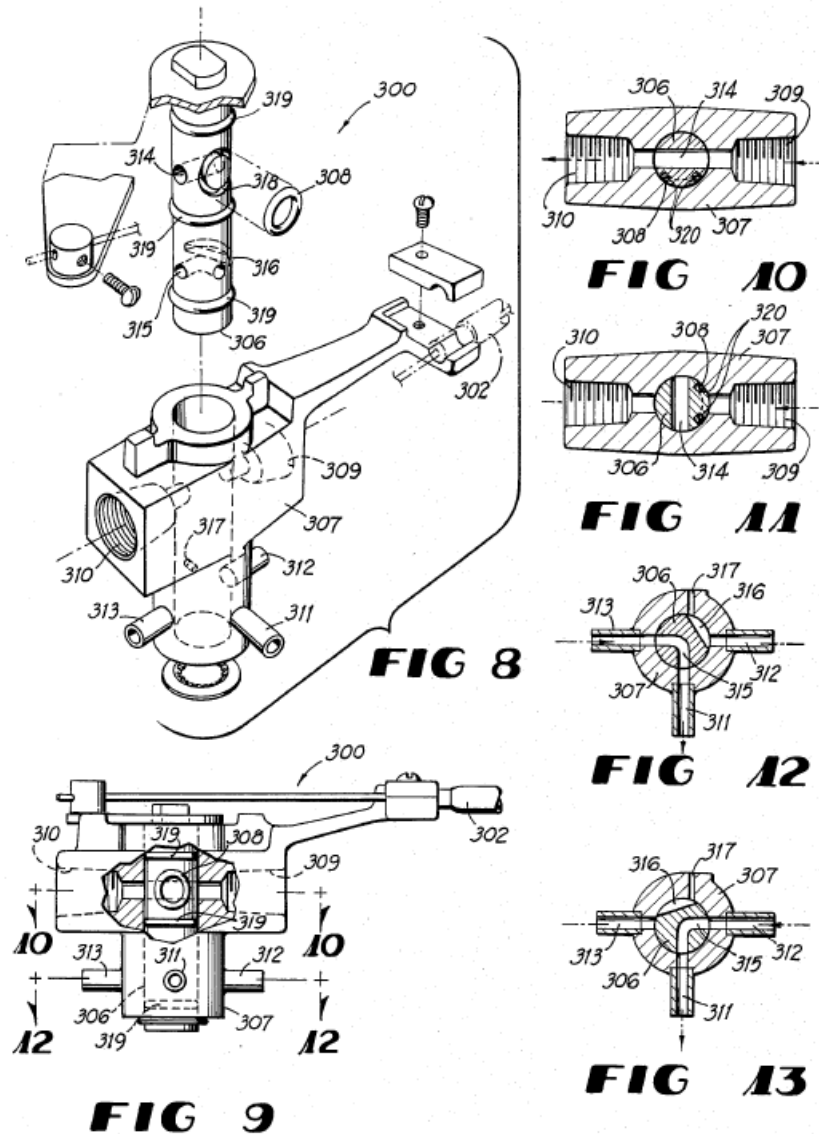


Ex.1006, Fig. 1.

Positioning of control 301 in the “gasoline” mode acts through control cable 302 to rotate spool 306 within valve body 307. *Id.*, 7:30–32. Simultaneously, gasoline from gasoline supply line 304 is supplied to the carburetor 110 through engine gasoline line 305, which lines communicate through tunnel 314 (as shown in Fig. 10) connecting liquid inlet opening 309 and liquid outlet opening 310 in

fluid dual valve 300. *Id.*, 7:33–44. In this mode, the carburetor functions normally. *Id.*

When the “propane” mode of control 301 is selected, spool 306 is rotated within valve body 307 by control cable 302 such that O-ring 308 on the face of spool 306 forms a seal between spool 306 and valve body 307 around liquid inlet opening 309 (as shown in Fig. 11) thereby prohibiting flow of gasoline to a conventional carburetor 110. *Id.*, 8:3–10.



Ex.1006, Figs. 8–13.

When the engine is started, a vacuum communicated to the engine intake manifold pressure chamber 40 via lines 112 and 30 creates a reduced pressure on the upper side of the liquid inlet diaphragm 10. *Id.*, 8:31–36. Atmospheric pressure on the opposite side of diaphragm 10 urges diaphragm upward against the liquid inlet lever 8, the opposite end of which drives inlet valve shaft 41 against bias

spring 3 and opens liquid inlet valve 2. *Id.*, 8:36–40. Upon opening valve 2, liquified gaseous fuel (e.g., propane) flows through inlet valve orifice 31 into liquified fuel passage 32 and onto the mixer 100. *Id.*, 8:40–60. When valve 2 is closed, valve 2 and related structures provide a “lock-off” of liquified gaseous fuel. *Id.*, 7:64–68.

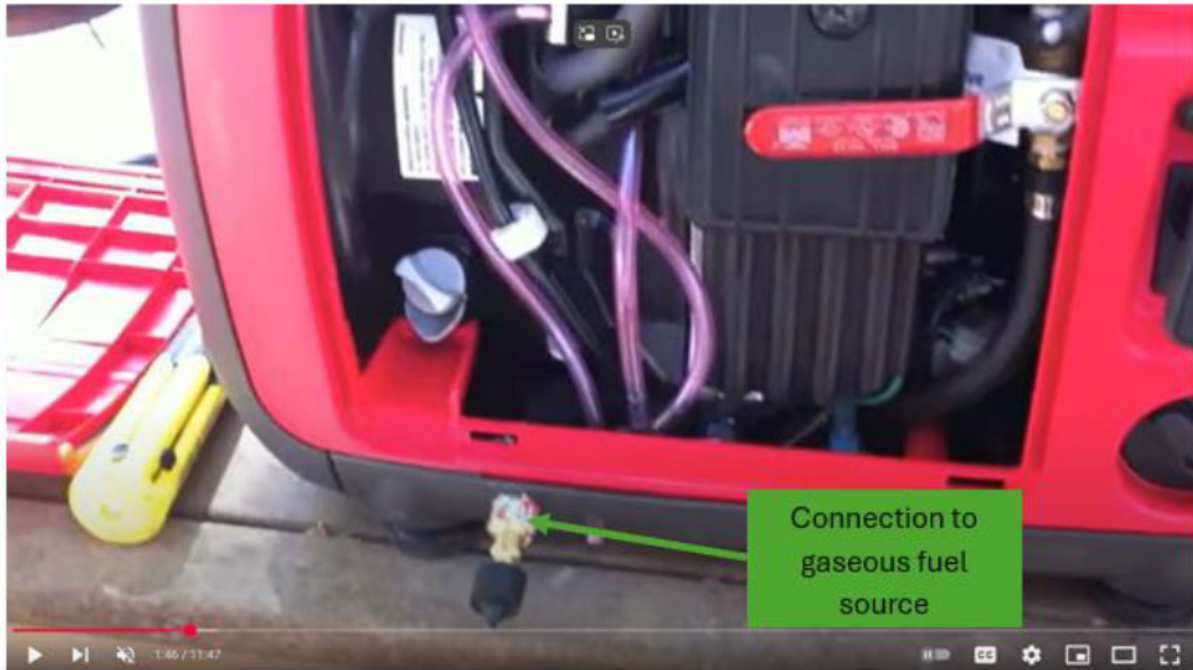
F. Tri-Fuel Video

The Tri-Fuel Video is a YouTube video entitled “Honda Generator Tri-Fuel, EU2000i Triple-Fuel,” posted by the profile “Mark ‘Mark1Jordon1’ Kash” on October 2, 2011, and viewed/commented on at least 13 years ago. Ex.1013-1014. Tri-Fuel Video is prior art under §102(a).

The Tri-Fuel Video discloses a Honda generator modified to operate on multiple different fuels. *Id.*, 0:36–2:00. The video shows a modified carburetor for use in the Honda generator so that propane or natural gas can be used to fuel the generator as alternatives to gasoline. *Id.* The video explains that a hole can be drilled in the carburetor and a hose attached to connect propane and/or natural gas fuel sources to alternatively power the generator. *Id.*

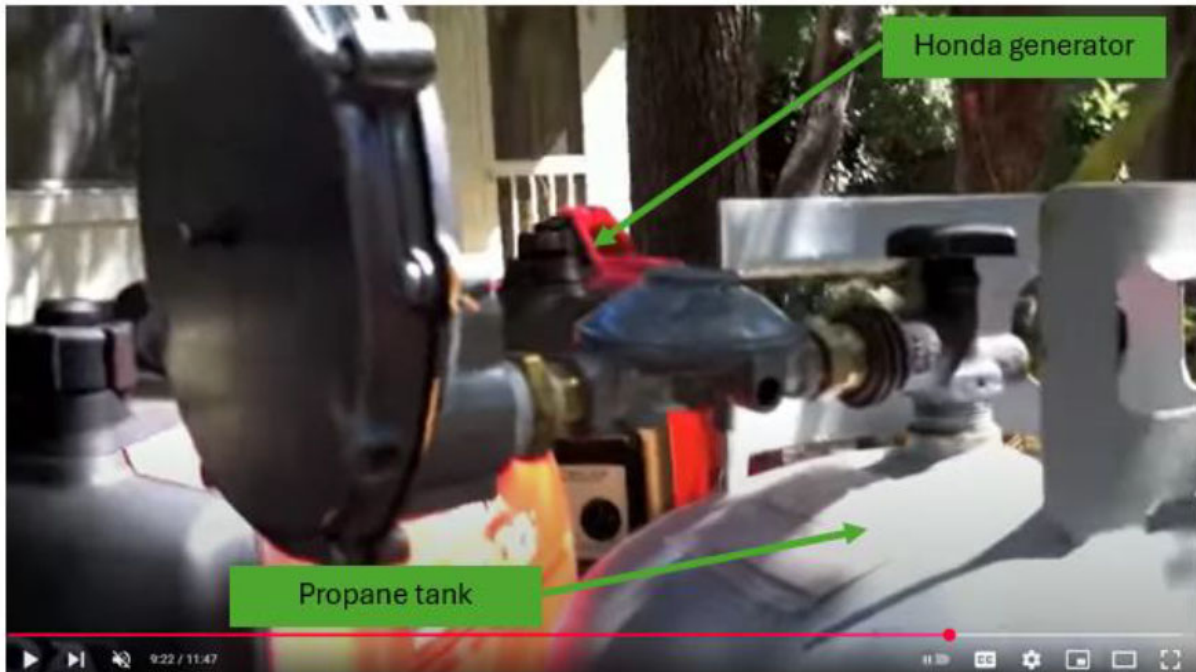


Id., 1:25 (annotated).|



Id., 1:46 (annotated).

The Tri-Fuel Video further shows that a propane tank and regulators are located remotely from the Honda generator:



The Tri-Fuel Video further explains that two regulators are attached to the propane tank (i.e., located remotely from the generator) to reduce the pressure of the propane in two stages. *Id.*, 2:00–3:26.



Id., 3:06.

The video shows a user connecting the propane tank to the generator through a hose.



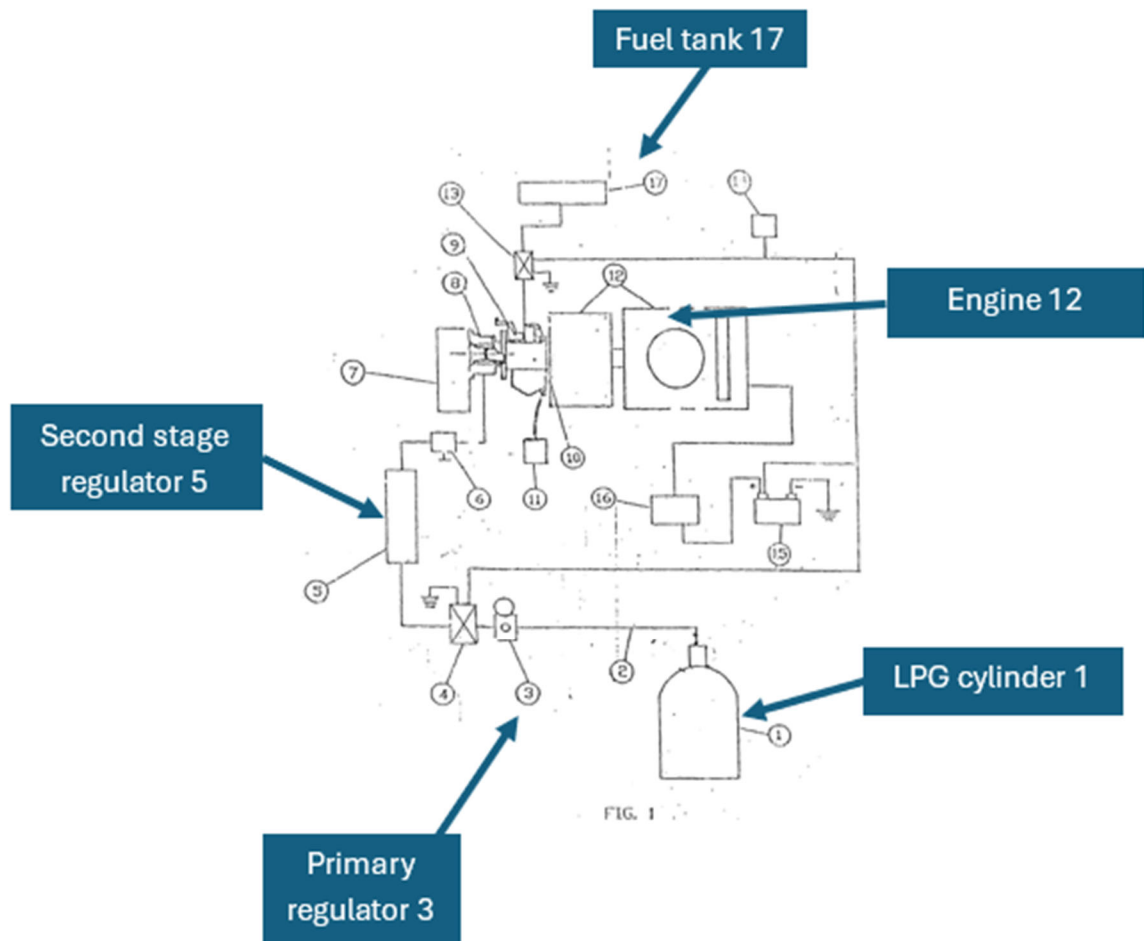
Thus, the Tri-Fuel Video shows a generator that has been modified to operate on multiple fuel sources by attaching a separate propane tank to a generator, with primary and secondary pressure regulators located at and attached directly to the propane tank (i.e., “off-board” the generator) to manage the pressure of the propane gas delivered to the generator engine.

G. Chaudhari

Chaudhari was filed in 1999, published in 2006, and issued in 2007. Ex.1010, 2; Ex.1011. Chaudhari is prior art under §102(a).

Chaudhari discloses “a system for supplying Liquified Petroleum Gas (LPG) to bi-fuel stationary engines in response to the load and speed of the engine, such engines preferably being coupled to a portable generator.” Ex.1010, 4. In the embodiment discussed, Chaudhari discloses a LPG delivery system connected to a generator that operates on gasoline or kerosene. *Id.*

The LPG delivery system includes a primary regulator 3 and a second stage regulator 5 to reduce the pressure of the LPG in two stages before delivery to the generator. *Id.*, 7.



Id., Fig. 1 (annotated).

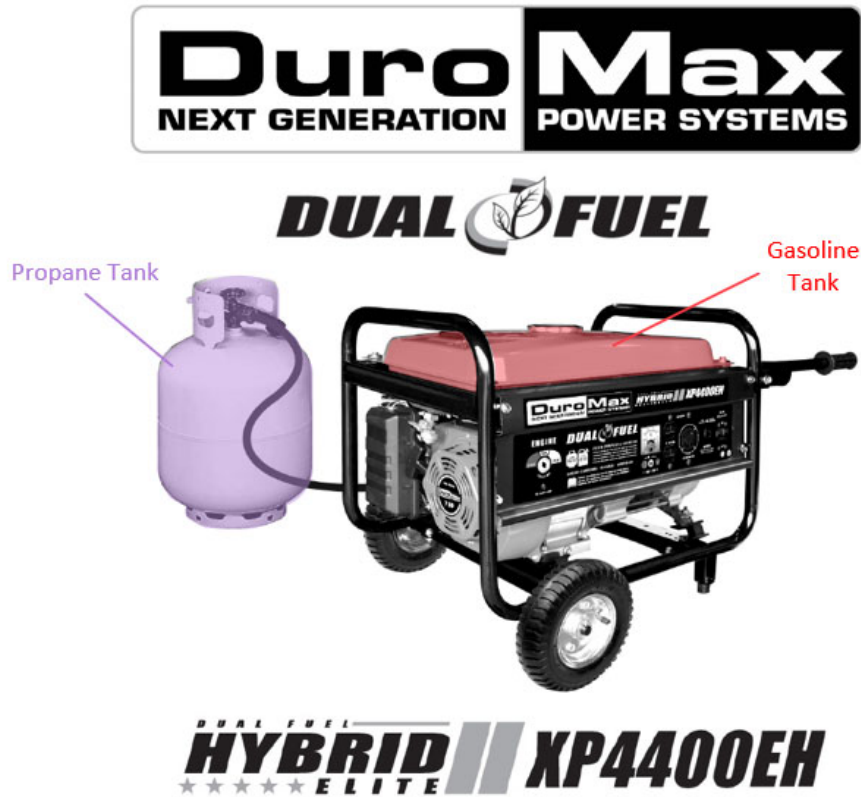
VII. THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. Ground 1: The Combination of DuroMax, Parlatore, and Elsdon Renders Obvious Claims 1 and 3–11.

1. Motivation to Combine DuroMax, Parlatore, and Elsdon, and POSA's Reasonable Expectation of Success

A POSA would have been motivated to use Parlature's off-board fuel regulator system with the DuroMax dual fuel system. Ex.1003, [0152]. DuroMax

discloses a first fuel tank that provides gasoline, and a second fuel tank that provides propane. Ex.1004, pp.1, 7.



Ex.1004, p.1 (Annotated)

A POSA would have understood that DuroMax discloses a liquid fuel source that provides liquid fuel from a liquid fuel tank to the dual fuel engine, and a pressurized fuel source that provides gaseous fuel from a pressurized fuel container to the dual fuel engine. Ex.1003, [0153].

Parlatore discloses a fuel delivery system that includes “a fuel tank that houses propane; a first regulator coupled to the fuel tank; a second regulator coupled to the first regulator; and a fuel metering system coupled to the second

regulator and delivering propane to an engine.” Ex.1007, [0005]. Parlatores further discloses a fuel system where “a gas, such as liquefied petroleum gas or propane, may be supplied to an engine as fuel.” *Id.*, [0014]. Parlatores discloses the LPG tank is pressurized. *Id.*, [0016] (LPG in tank is in a “high pressure state,” which is “approximately 180-250 psi”). The LPG is in gaseous state when delivered to the engine through a gaseous fuel line (one or more hoses). *Id.*, [0017] (system lets “fuel vapor flow into the carburetor 114”), [0018] (system feeds “vaporized propane into carburetor 114 through hose 112”). Ex.1003, [0155].

One reason to locate the fuel delivery regulators off-board from the generator and near or at the LPG tank is so that the fuel line leading to the engine will already be at the relatively lower pressure set by the output of the secondary regulator. Ex.1003, [0156]. This enhances safety in case this fuel line is punctured or damaged in some way, since the fuel in this line will be at a lower pressure. *Id.* Additional benefits include improved access for servicing and more stable operating conditions (i.e., less exposure to heat and vibrations created by the generator, both of which can prematurely wear the regulator components). *Id.*

It would have been obvious to a POSA to use the off-board fuel regulator system disclosed in Parlatores because Parlatores discloses the use of a regulator system with “any desired form of engine” and specifically suggests the use of its regulator system with generators. Ex.1007, [0019], [0025]; *see also id.*, [0024]

(suggesting off-board configuration “where more fuel may be desired”); Ex.1003, [0157]. A POSA would thus be motivated to combine the regulator systems described in Parlatore to regulate the gaseous fuel from a pressurized fuel container to the dual fuel engine described in DuroMax. *Id.*

A POSA would have had a reasonable expectation of success in using Parlatore’s off-board fuel regulator system with the DuroMax dual fuel system given that this implementation was already demonstrated by Parlatore. *See* Ex.1007, [0019] (“For example, this embodiment may be beneficial in some desired situations ... such as generators.”). Moreover, the use of regulators with LPG tanks has been commonplace for decades. Ex.1003, [0158].

DuroMax discloses that the generator includes a mechanical fuel valve that stops gasoline fuel from exiting the gasoline tank and being delivered to the generator engine when run on LPG fuel. Ex.1004, pp.11,12.

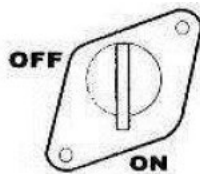


Figure 6 - fuel valve in the "on" position

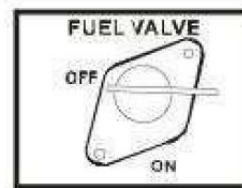


Figure A - Fuel Valve in the "OFF" position

Ex.1004, pp.11,12.

To start your generator with gasoline, perform the following steps:

- 3 Turn the gasoline fuel valve to the "ON" position

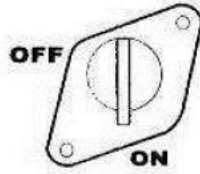


Figure 6 - fuel valve in the "on" position

Ex.1004, p.11.

To start your generator with LPG, perform the following steps:

3. Turn the gasoline fuel valve to the "OFF" position (see *figure 6*).

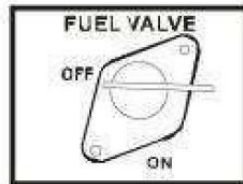


Figure A - Fuel Valve in the "OFF" position

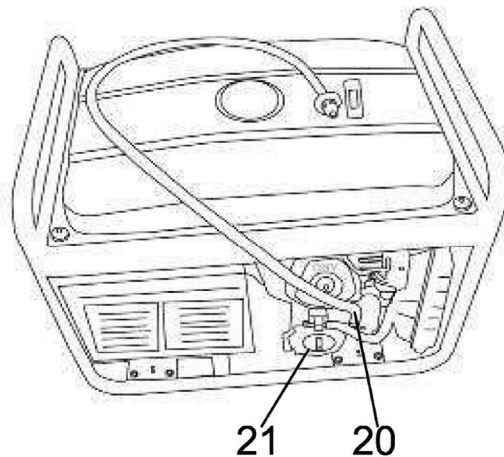
Ex.1004, p.12.



Figure 19 –Removing the Fuel Filter Cup

Ex.1004, p.20 (Annotated).

DuroMax also discloses an onboard LPG tank connector that couples to an LPG hose of an external LPG tank for delivering LPG fuel to the generator engine when run on LPG fuel. Ex.1004, p.7.



20. Hose connector- Connect liquid propane gas to generator.

Ex.1004, pp.7-8.

A POSA would understand that DuroMax is not configured to run on both fuel sources at the same time. Ex.1003, [0161]. For example, DuroMax provides the following warning:

 **CAUTION:**
**When using gasoline, LPG must be shut off! When using LPG,
gasoline must be shut off!**

Ex.1004, p.11.

This is consistent with the background section of the ‘654 Patent, which discloses that prior art dual fuel engines “can experience overly rich air-fuel ratio when both fuels are simultaneously engaged” which can “make the engine hard to start or lead to unstable operating conditions.” Ex.1001, 1:58-63. *See Qualcomm Inc. v. Apple Inc.*, 24 F.4th 1367, 1375 (Fed. Cir. 2022) (“[I]t is appropriate to rely on admissions in a patent’s specification when assessing whether that patent’s claims would have been obvious’ in an *inter partes* review proceeding.”); *see also* USPTO, Updated Guidance on the Treatment of Statements of the Applicant in the Challenged Patent in Inter Partes Reviews under §311, at 4 (June 9, 2022).

Elsdon discloses a cap and shield assembly for covering a fluid conduit (i.e., a fuel line). Ex.1005, 3:3–14; Ex.1003, [0163]. Elsdon discloses that by rotating cap 16 over conduit coupler 12, cap 16 prohibits access to the coupler interface,

thereby preventing connecting of a hose with the coupler interface. Ex.1005, 3:3–14, 5:1–10.

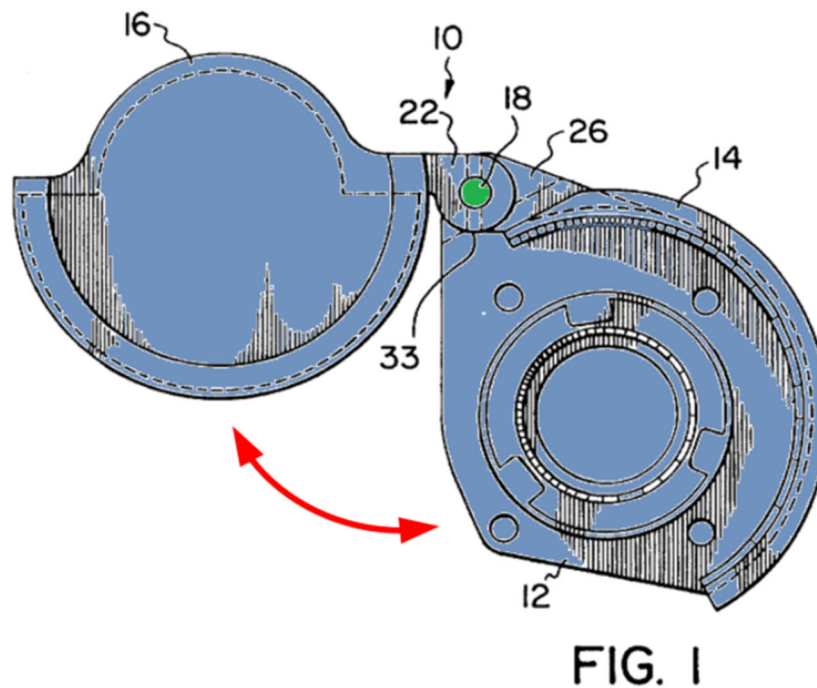
Elsdon explicitly recognizes the importance of properly sequencing the connection of fuel sources with the opening of associated valves. For example, Elsdon notes that it may be important to ensure the closing or opening of fuel valves before permitting coupling or uncoupling to the connection interface. Ex.1005, 1:23–40. Elsdon discloses that its cap and shield may be utilized in such sequenced interconnected valve and coupler arrangements. Ex.1005, 4:44–53.

A POSA would be motivated to implement the fuel conduit coupler cap assembly of Elsdon to selectively cover and uncover the LPG fuel conduit coupler of DuroMax. Ex.1003, [0165]. Specifically, a POSA would have been motivated to connect the Elsdon fuel conduit coupler cap to the mechanical fuel valve of DuroMax to restrict access to the LPG hose connector interface of DuroMax when the DuroMax generator is running gasoline fuel. *Id.*

A POSA would have understood that by implementing the Elsdon fuel conduit coupler cap assembly in this way, one could link the opening and closing of the DuroMax mechanical fuel valve with the covering and uncovering of the LPG fuel conduit coupler. Ex.1003, [0166]. A POSA would have understood such an arrangement to prevent simultaneous use of LPG and gasoline, which was a

known problem with generators such as DuroMax. Ex.1004, p.11; Ex.1001, 1:58-63; Ex.1003, [0166].

A POSA would have had a reasonable expectation of success in implementing the fuel conduit coupler cap of Elsdon onto the LPG fuel conduit coupler of DuroMax. Ex.1003, [0167]. Elsdon emphasizes that its cap assembly may be “retrofit” to cover existing fuel couplers on “construction equipment” such as a generator. Ex.1005, 2:27–32; 5:11–14. Elsdon utilizes a simple connection arrangement, in which cap 16 rotates around the axis of the shaft 18. *See* Ex.1005, Figs. 1, 3 below (annotated).



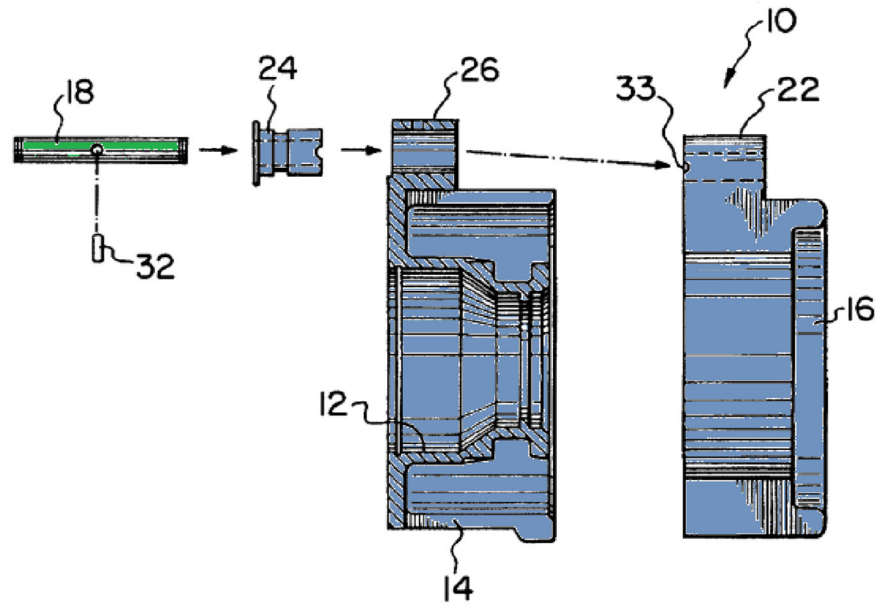


FIG. 3

A POSA would have understood that the fuel valve of DuroMax is a simple mechanical fuel valve utilizing a valve handle that rotates a shaft connected to a stop inside of the valve body for preventing fuel flow. Ex.1004, pp.11,12; Ex.1003, [0168].

A POSA would have understood that the valve handle and shaft of the DuroMax fuel valve could be readily connected to cap 16 of Elsdon such that the DuroMax valve handle and shaft rotate together with Elsdon cap 16. Ex.1003, [0169].

A POSA would have further understood that the fuel valve and LPG fuel conduit coupler of DuroMax could easily be moved to different positions on the generator such that the two components are located immediately next to each other.

Ex.1003, [0170]; *see also* Ex.1018, 00:15:39–00:16:20 (discussing how the

position of the LPG inlet connector on a portable generator can be easily moved around the generator). In that case, cap 16 of Elsdon would rotate with the valve handle of the DuroMax fuel valve to cover the LPG fuel conduit coupler when the DuroMax fuel valve is open, and would rotate to permit access to the LPG fuel conduit coupler when the DuroMax fuel valve is closed. Ex.1003, [0171].

2. Claim 1

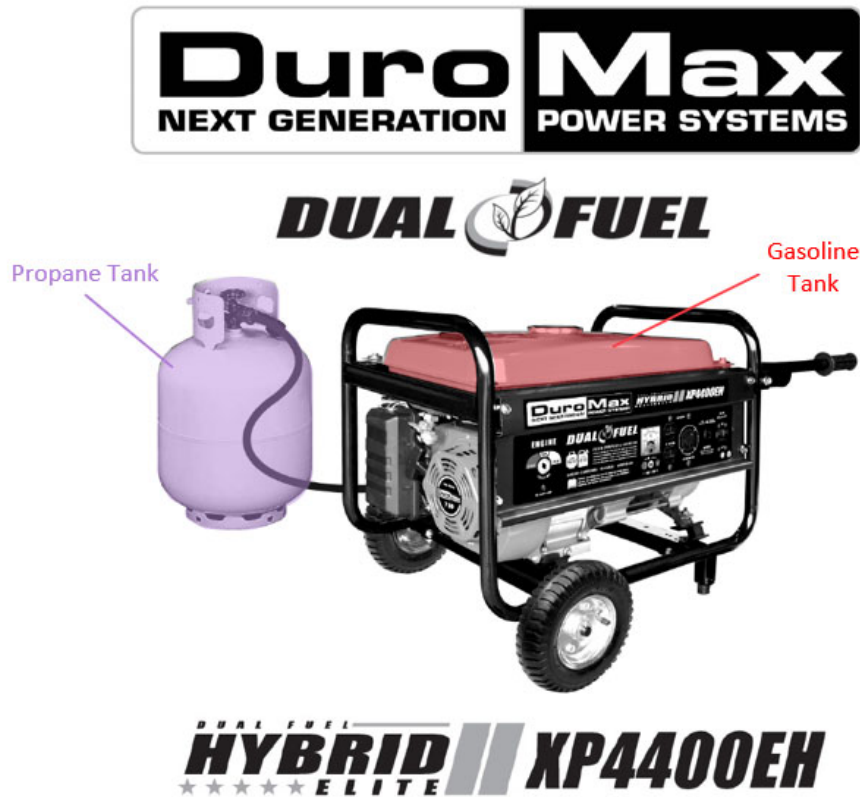
The combination of DuroMax, Parlature, and Elsdon teaches all limitations of claim 1.

a. Element [1.0]

To the extent the preamble is limiting, the combination of DuroMax and Parlature teaches [1.0]. DuroMax discloses a dual fuel generator in which either LPG or gasoline may be selected for operation of the generator. Ex.1004, pp.11-12. Parlature discloses a fuel delivery system for use with a generator. Ex.1007, Abstract, [0013]-[0021].

b. Element [1.1]

DuroMax discloses a first fuel tank and a second fuel tank. Ex.1004, p.1.

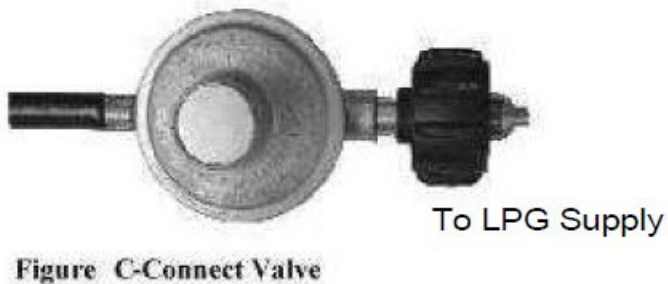


Ex.1004, p.1. (Annotated)

The first fuel tank provides liquid gasoline, and the second fuel tank provides gaseous propane. Ex.1004, pp. 7,11–12. DuroMax discloses the liquid fuel (gasoline) is supplied from a liquid fuel tank through a liquid fuel line. *Id.*, 9, 20–21, 30–31 (parts diagram/list depicting liquid fuel line as “Part No. 137, Outlet Pipe”). A POSA would have understood that DuroMax discloses a liquid fuel source that provides liquid fuel from a liquid fuel tank to the dual fuel engine. Ex.1003, [0175].

DuroMax also discloses a gaseous fuel line that supplies the gaseous fuel (LPG) from a pressurized fuel source. Ex.1004, p.1 (hose from LPG tank to

generator), p.12 (LPG hose shown below), and pp.31-32 (parts diagram/list depicting liquid fuel line as “Part No. 161, Gas Tube”).



Ex.1004, Fig. C, p.12.

A POSA thus would also have understood that DuroMax discloses a pressurized fuel source that provides gaseous fuel from a pressurized fuel container to the dual fuel engine. Ex.1003, [0177].

Accordingly, a POSA would have understood that DuroMax teaches [1.1]. Ex.1003, [0178].

c. Element [1.2]

Parlatore discloses a propane vapor delivery system. Ex.1007, [0013], Figs. 1-3.

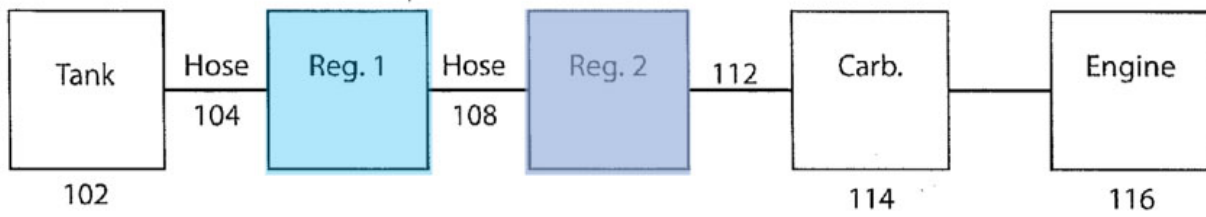


Fig. 1

Ex.1007, Fig. 1 (Annotated).

As shown in Fig. 3, the “LPG tank 300 may be located separate, but coupled to, an engine 310.” Ex.1007, [0020], Fig. 3.

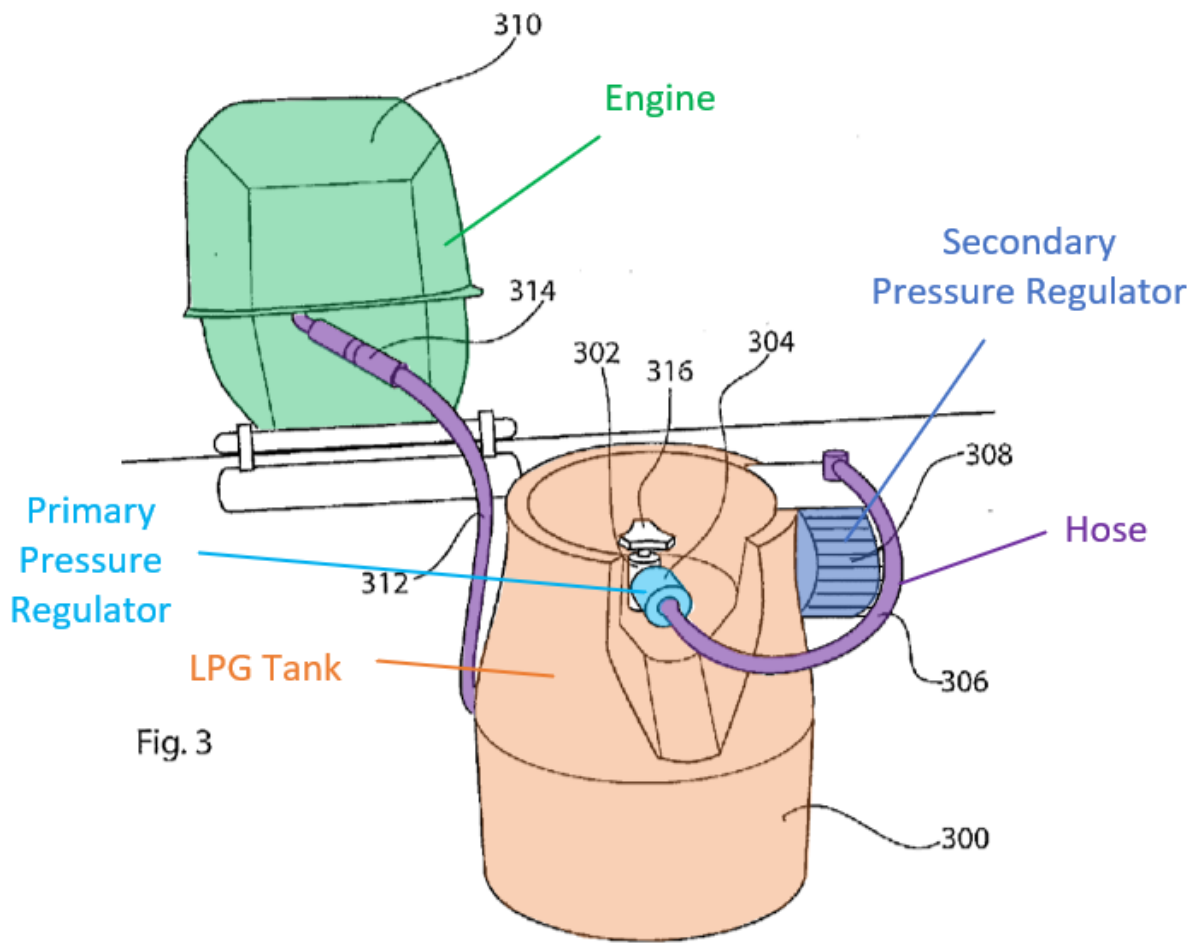


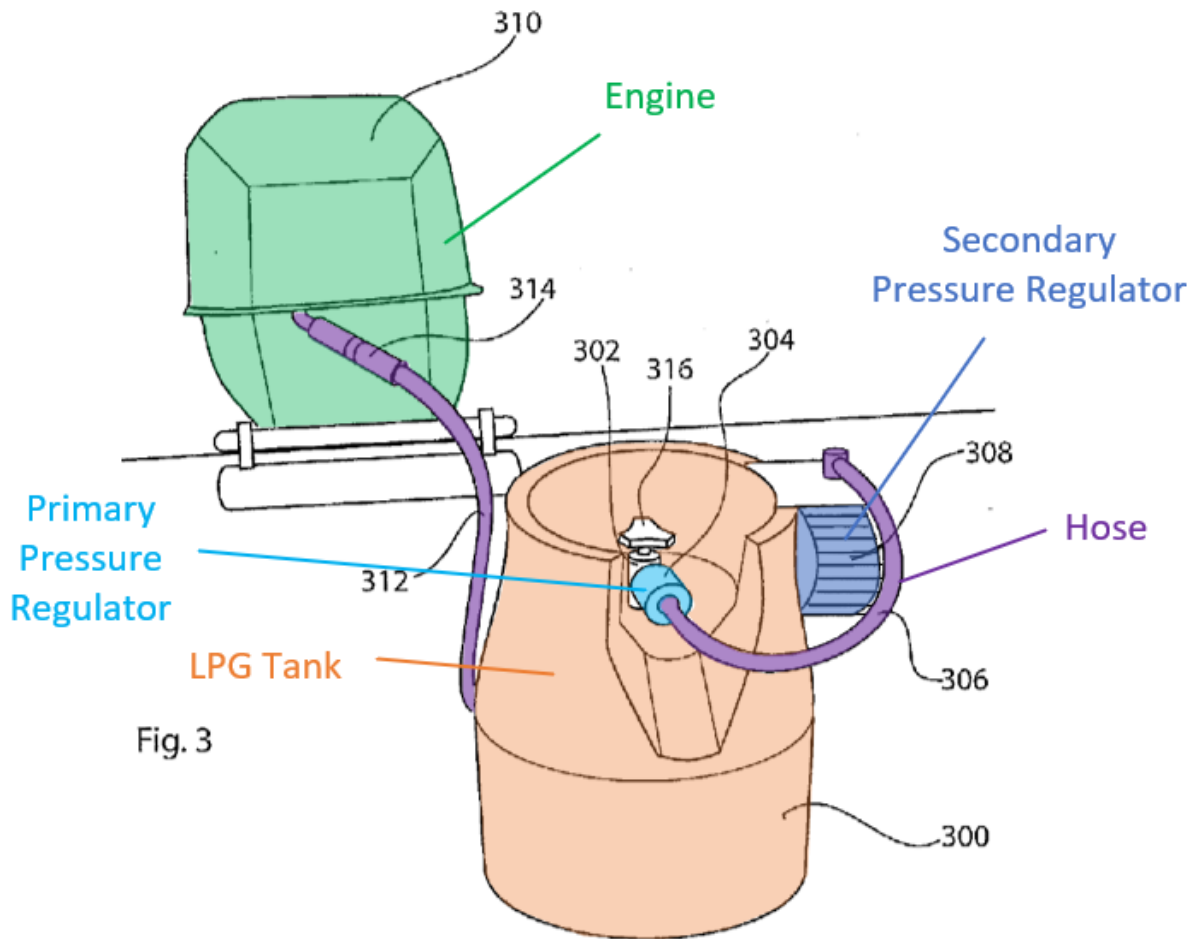
Fig. 3

Ex.1007, Fig. 3 (Annotated).

Parlatore discloses that its propane vapor delivery system can be used for “generators” “or any situation where more fuel may be desired.” Ex.1007, [0019],[0024]. A POSA would understand that the propane vapor delivery system of Parlatore is a fuel regulator system located off board the dual fuel generator. Ex.1003, [0181]. Accordingly, a POSA would understand that the combination of DuroMax and Parlatore teaches [1.2]. *Id.*

d. Element [1.3]

Parlatore discloses that “[t]he LPG tank 300 may be connected to the primary regulator 304 as described previously, for example by connector 302.” Ex.1007, [0020].



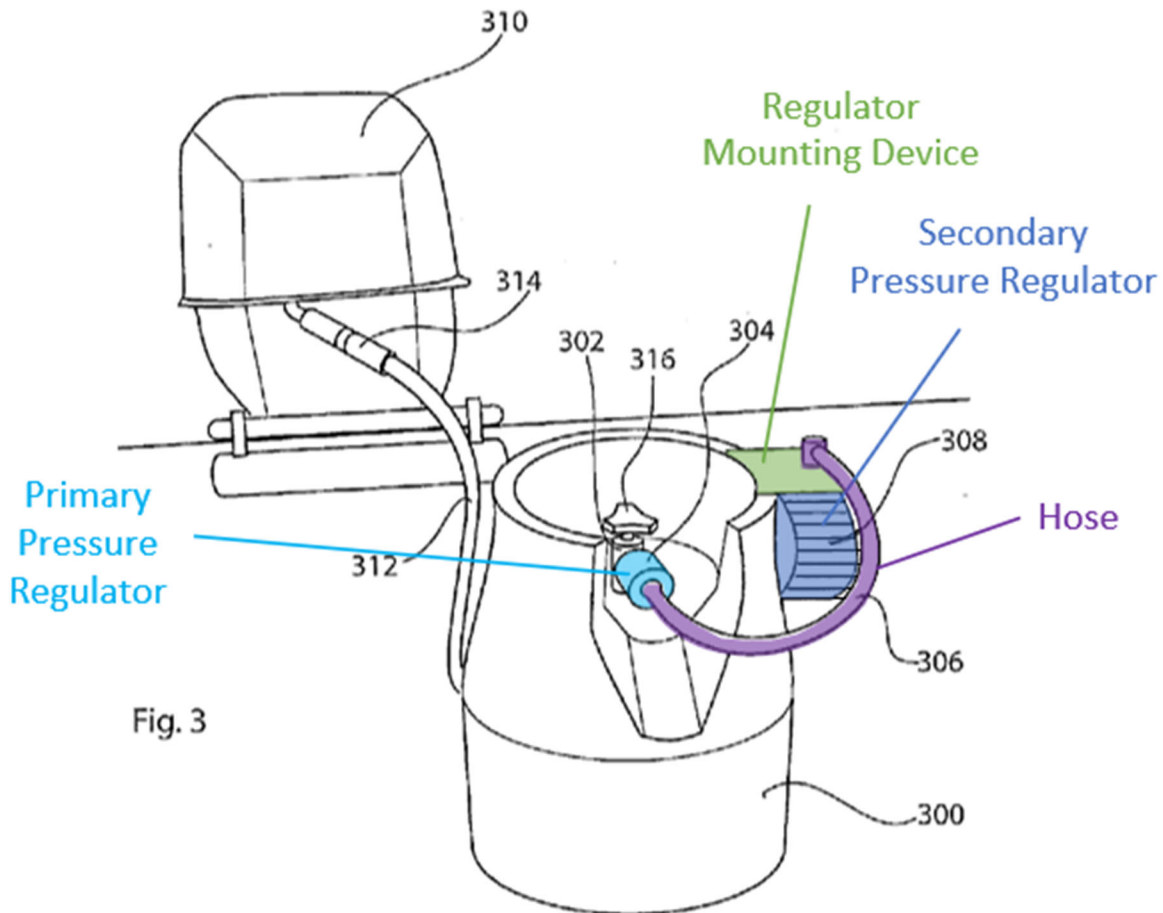
Ex.1007, Fig. 3 (Annotated).

Parlatore discloses that the “primary regulator 106 may step down the pressure of any stored propane vapor energy in tank 102 and may further output this lowered pressure to a secondary regulator 110.” *Id.*, [0016]. A POSA would thus understand that the primary pressure regulator of Parlatore is coupled to a service valve (a “safety fuel shut-off valve 316,” *id.*, [0023]) of the pressurized fuel source and configured to regulate the fuel supplied from the pressurized fuel source to a reduced pressure. Ex.1003, [0183].

Accordingly, a POSA would understand that combination of DuroMax and Parlatore teaches [1.3]. Ex.1003, [0184].

e. Element [1.4]

“[P]rimary regulator 304 and...secondary regulator 308 may be two separate regulators that can be based on the design and size of an engine.” Ex.1007, [0021].



Ex.1007, Fig.3 (annotated)

“The primary regulator 304 in this exemplary embodiment may be connected to LPG tank 300 as described above.” *Id.* Parlatore discloses a

secondary regulator 308 connected to the primary regulator 304 “by a hose 306, pipe, tube or the like” (e.g., a “gaseous fuel line”). *Id.*

Parlatore discloses that the “the secondary regulator 110 can meter propane gas to an engine 116,” *id.*, [0016], and that the “low pressure output of the secondary regulator 308 may be attached to a propane carburetor (not pictured) on the engine 310 in any of a variety of manners.” *Id.*, [0020]. The LPG is in gaseous state when delivered to the engine through a gaseous fuel line (one or more hoses). *Id.*, [0017] (system lets “fuel vapor flow into the carburetor 114”), [0018] (system feeds “vaporized propane into carburetor 114 through hose 112”). Ex.1003, [0186].

A POSA would thus understand that the primary pressure regulator is coupled to the secondary pressure regulator, and that the secondary pressure regulator is configured to regulate the gaseous fuel supplied from the primary pressure regulator to a desired pressure for delivery through the gaseous fuel line to operate the dual fuel generator. Ex.1003, [0187]. Accordingly, a POSA would understand that combination of DuroMax and Parlatore teaches [1.4]. *Id.*

f. Element [1.5]

DuroMax discloses a mechanical fuel valve coupled to the internal combustion engine to selectively control fuel flow to the generator. Ex.1004, pp.11-12.

To start your generator with gasoline, perform the following steps:

- 3 Turn the gasoline fuel valve to the "ON" position

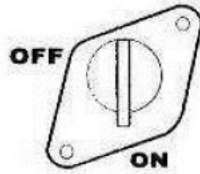


Figure 6 - fuel valve in the "on" position

Ex.1004, p.11.

To start your generator with LPG, perform the following steps:

3. Turn the gasoline fuel valve to the "OFF" position (see *figure 6*).

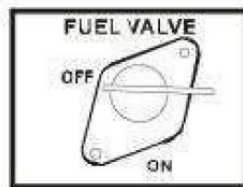


Figure A - Fuel Valve in the "OFF" position

Ex.1004, p.12.

A POSA would understand that while DuroMax can run on either gasoline fuel or LPG fuel, DuroMax is not configured to run on both fuel sources at the same time. Ex.1003, [0189]. For example, DuroMax provides the following warning:

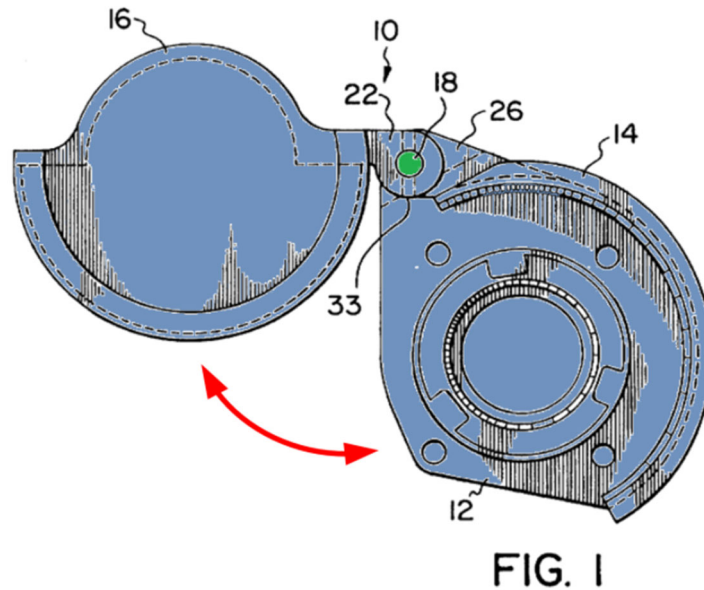


CAUTION:

When using gasoline, LPG must be shut off! When using LPG, gasoline must be shut off!

Ex.1004, p.11.

Elsdon discloses a fuel conduit coupler shield 14 and cap 16 that when closed prevents connection of a fuel source. Ex.1005, 3:3-14. Elsdon discloses that by rotating cap 16 over conduit coupler 12, cap 16 prohibits access to the coupler interface, thereby preventing connecting of a hose with the coupler interface. *Id.*, 3:3-14, 5:1-10.



Ex.1005, Fig. 1 (annotated).

It would have been obvious to a POSA to combine the Elsdon fuel conduit coupler cap with the gasoline fuel valve of DuroMax to provide a mechanical fuel valve that both controls the flow of gasoline from the tank through the gasoline line (as disclosed by DuroMax) and simultaneously rotates to block and unblock the LPG inlet (as disclosed by Elsdon). §VII.A.1, *supra*; Ex.1003, [0191].

By blocking and unblocking the LPG inlet, this combined apparatus would selectively control the flow of LPG through the LPG fuel line. *Id.* This combination would appear and function the same way as Figures 2-4B of the '654 Patent. Ex.1003, [0192]. Accordingly, a POSA would understand that combination of DuroMax and Elsdon teaches [1.5]. *Id.*

g. Element [1.6]

The term “fuel lockout apparatus” is properly construed as a means plus function term covering items 58, 61 in Figs. 2, 3, 4A, 4B, as described at Ex.1001, 5:56–6:17; 6:29–50; 6:53–7:40; 8:49-9:8, and equivalents thereof. §V.A, *supra*.

As noted above, it would have been obvious to have connected the valve handle and shaft of the DuroMax fuel valve to cap 16 of Elsdon, which would have resulted in a flange that is rigidly coupled to a fuel valve handle, with the flange extending radially from the fuel valve handle so that the flange rotates with the fuel valve handle and rotates transversely over the fuel inlet for LPG between a first position in which the flange blocks access to the fuel inlet for the LPG when the fuel valve handle is in position to allow gasoline to run the engine, and between a second position in which the flange does not block the fuel inlet for the LPG when the fuel valve handle is in position to restrict gasoline from running the engine. §VII.A.1, *supra*.

A POSA would therefore understand that the combination of DuroMax and Elsdon teaches a “fuel lockout apparatus coupled to [a] mechanical fuel valve” as recited in [1.6]. Ex.1003, [0195].

h. Element [1.7]²

It would have been obvious to connect the valve handle and shaft of the DuroMax fuel valve to cap 16 of Elsdon to provide a “fuel lockout apparatus” that prevents the simultaneous flow of gasoline and LPG fuel to the dual fuel engine. §VII.A.1, *supra*. The DuroMax mechanical fuel valve rotates between a first position in which the valve is opened (communicating the gasoline fuel source to the dual fuel engine) and a second position in which the valve is closed (interrupting communication of the gasoline fuel source to the dual fuel engine). Ex.1004, pp.11-12. Cap 16 of Elsdon would rotate with the valve handle of the DuroMax fuel valve to cover the LPG fuel conduit coupler when the DuroMax fuel valve is open, and would rotate to permit access to the LPG fuel conduit coupler when the DuroMax fuel valve is closed. §VII.A.1, *supra*.

² While Claim 1 discusses the “fuel lockout apparatus [communicating] the first fuel source” and “interrupting first fuel source communication,” the disclosure of the ’654 Patent associates this functionality with the mechanical fuel valve assembly. While Claim 1 appears to be invalid under 35 U.S.C. §112 as a result, to the extent it is construed to cover the structure disclosed in FIGS. 2-4B of the ’654 Patent, it is invalid over DuroMax and Elsdon, which discloses the same structure.

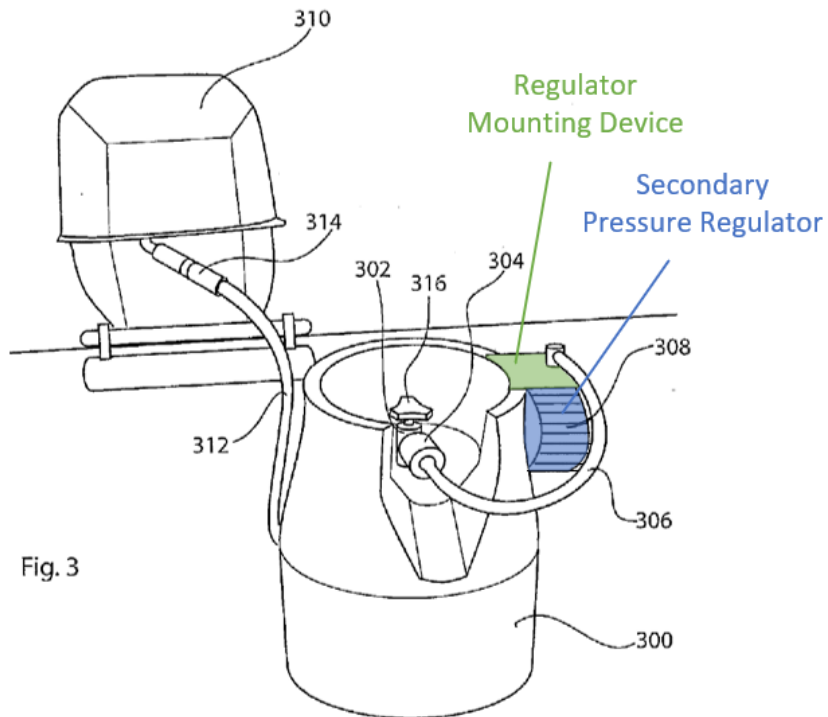
It would have been obvious to connect these components so that cap 16 covers the LPG fuel conduit coupler when the mechanical fuel valve is in the open (first) position (preventing the pressurized fuel source from coupling to the dual fuel engine) and to uncover the LPG fuel conduit coupler (permitting the pressurized fuel source to couple to the dual fuel engine) when the mechanical fuel valve is in the closed (second) position. *Id.*

A POSA would therefore understand that the combination of DuroMax and Elsdon teaches [1.7]. Ex.1003, [0198].

3. Claim 3

The combination of DuroMax, Parlature, and Elsdon teaches claim 1. Parlature teaches the additional limitations of dependent claim 3.

As shown in Fig. 3, Parlature discloses a secondary pressure regulator 308 mounted on a mounting device secured to the tank. Ex.1007, Fig. 3; Ex.1003, [0200].



Ex.1007, Fig. 3 (annotated).

The mounting device also is mounted to the pressurized fuel source. *Id.* A POSA would therefore understand that the combination of DuroMax, Parlature, and Elsdon teaches claim 3. Ex.1003, [0201].

4. Claim 4

The combination of DuroMax, Parlature, and Elsdon teaches claims 1 and 3. Parlature teaches the additional limitations of dependent claim 4.

Parlature discloses a primary pressure regulator. *Supra*, §VII.A.1.c. Parlature also discloses that at least the secondary pressure regulator 308 is mounted on a mounting device secured to the tank. *Supra*, §VII.A.2. Furthermore,

Parlatore discloses that the primary and secondary regulators can be combined as an integral two-stage regulator. Ex.1007, [0018].

LP-Gas Handbook discloses that integral two-stage regulators were known in the art many years before the priority date of the '654 Patent:

3.3.64.2 First-Stage Regulator. A pressure regulator for LP-Gas vapor service designed to reduce pressure from the container to 10.0 psig (69 kPag) or less.

3.3.64.3 High-Pressure Regulator. A pressure regulator for LP-Gas liquid or vapor service designed to reduce pressure from the container to a lower pressure in excess of 1.0 psig (6.9 kPag).

3.3.64.4 Integral 2 psi Service Regulator. A pressure regulator for LP-Gas vapor service that combines a high-pressure regulator and a 2 psi service regulator into a single unit.

3.3.64.5 Integral Two-Stage Regulator. A pressure regulator for LP-Gas vapor service that combines a high-pressure regulator and a second-stage regulator into a single unit.

3.3.64.6 Line Pressure Regulator. A pressure regulator in accordance with the *Standard for Line Pressure Regulators*, ANSI Z-21.80/CSA 6.22, with no integral overpressure protection device for LP-Gas vapor service designed for installation inside a building to reduce a nominal 2 psig inlet pressure to 14 in. w.c. (4.0 kPa) or less.

3.3.64.7 Second-Stage Regulator. A pressure regulator for LP-Gas vapor service designed to reduce first-stage regulator outlet pressure to 14 in. w.c. (4.0 kPag) or less.

3.3.64.8 Single-Stage Regulator. A pressure regulator for LP-Gas vapor service designed to reduce pressure from the container to 1.0 psig (6.9 kPag) or less.

3.3.64.9 2 psi Regulator System. An LP-Gas vapor delivery system that combines a first-stage regulator, a 2 psi (14 kPag) service regulator, and a line pressure regulator(s).

3.3.64.10 2 psi Service Regulator. A pressure regulator for LP-Gas vapor service designed to reduce first-stage regulator outlet pressure to a nominal 2 psig (14 kPag).

3.3.64.11 Two-Stage Regulator System. An LP-Gas vapor delivery system that combines a first-stage regulator and a second-stage regulator(s), or utilizes a separate integral two-stage regulator.

Ex.1009, pp.40-41 ((§3.3.64) (annotated)).

For example, off-the-self, integral dual-stage regulators were generally available at least by 2008, as shown below:



EXHIBIT 3.12 Integral Two-Stage Regulator. (Courtesy of Engineered Controls International, Inc.)

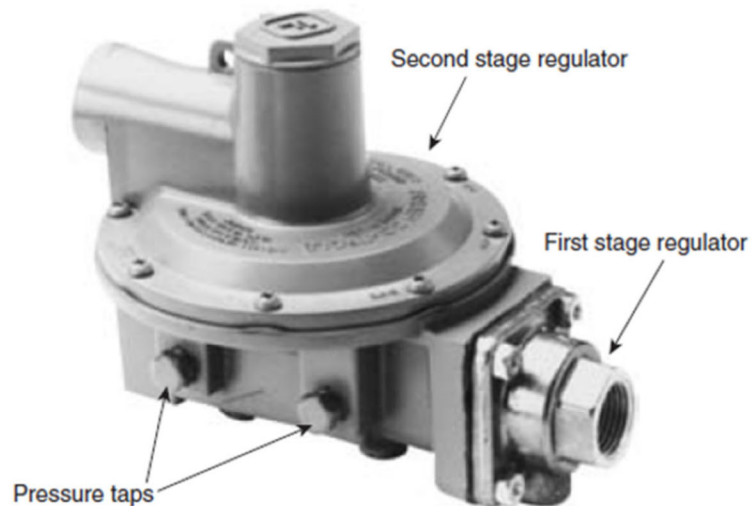


EXHIBIT 5.47 Integral Two-Stage Regulator. (Courtesy of Fisher Controls Intl, LLC)

Ex.1009, pp.41,120.

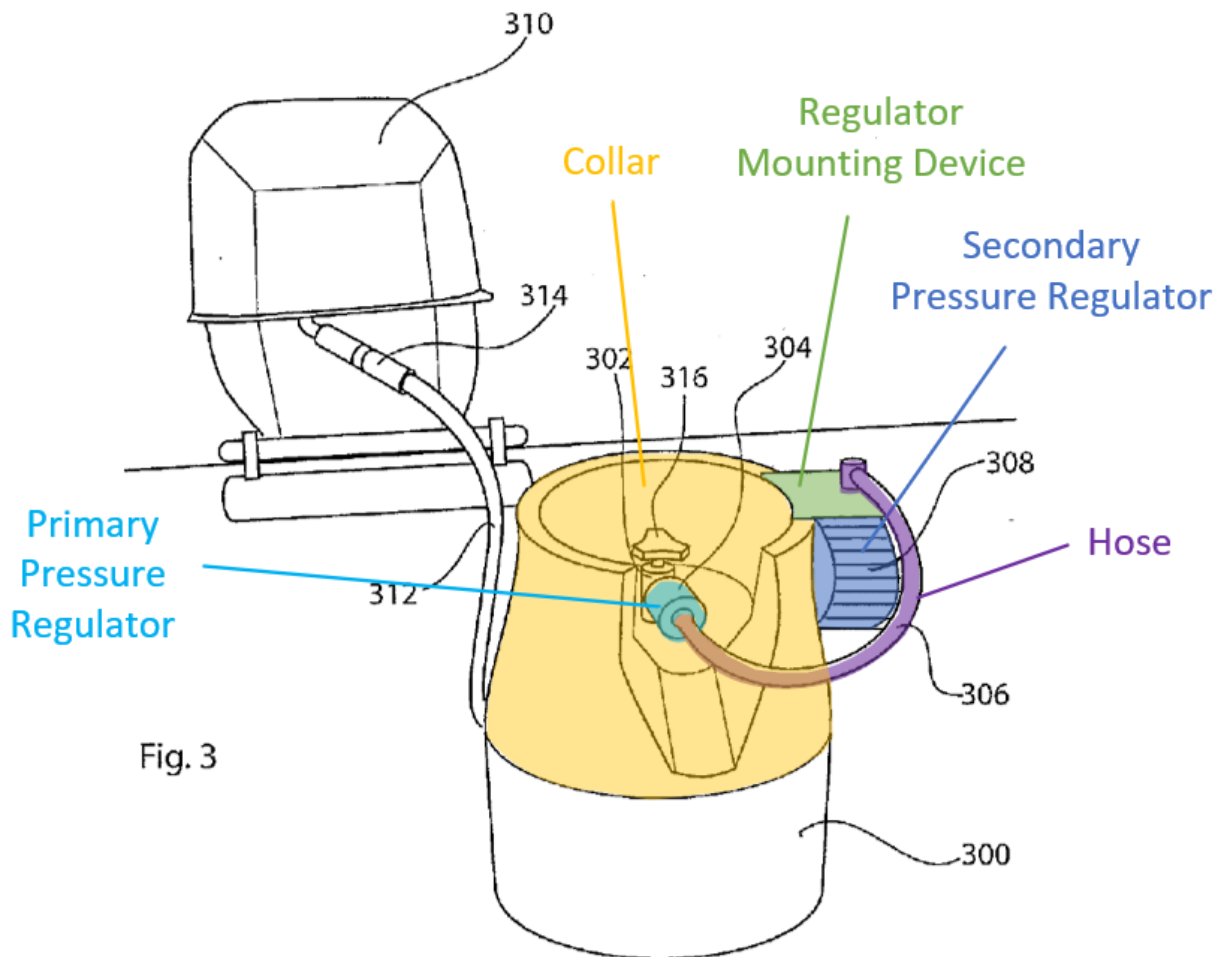
As discussed in Parlature, the integral two-stage regulator 202 may be used “[i]n further exemplary embodiments” including the combined, two-stage regulator with the off-board embodiment shown in Fig 3. Ex.1007, [0018]; Fig. 3.

A POSA would understand that the same mounting arrangement from Fig. 3 can be used with an integral two-stage regulator (instead of separate regulators), thereby mounting the primary pressure regulator on the mounting device. Ex.1003, [0209].

A POSA would understand that the combination of DuroMax, Parlatore, and Elsdon teaches claim 4. Ex.1003, [0210].

5. Claim 5

The combination of DuroMax, Parlatore, and Elsdon teaches claims 1, 3, and 4. Parlatore teaches the additional limitations of dependent claim 5. Fig. 3 of Parlatore discloses the mounting device secured to the collar of the propane tank. Ex.1007, Fig. 3.



Ex.1007, Fig. 3 (Annotated).

Parlatore and LP-Gas Handbook also disclose that the primary and secondary regulators can be combined as a single, two-stage regulator. §VII.A.4, *supra*. A POSA would understand that the combined dual stage regulator could be mounted on the collar. Ex.1003, [0215]. In this arrangement, the primary and secondary pressure regulators would be positioned adjacent each other along an outer periphery of the collar. *Id*.

A POSA would understand that the combination of DuroMax, Parlatore, and Elsdon teaches claim 5. Ex.1003, [0216].

6. Claim 6

a. Element [6.0]

To the extent the preamble is limiting, DuroMax and Parlatore teach [6.0] for at least the same reasons as [1.0]. §VII.A.2.a, *supra*.

b. Element [6.1]

DuroMax teaches [6.1] for at least the same reasons as [1.1]. §VII.A.2.b, *supra*.

c. Element [6.2]

The combination of DuroMax and Parlatore teaches [6.2] for at least the same reasons as [1.2]. §VII.A.2.c, *supra*.

d. Element [6.3]

The combination of DuroMax and Parlatore teaches [6.3] for at least the same reasons as [1.3]. §VII.A.2.d, *supra*.

e. Element [6.4]

The combination of DuroMax and Parlatore teaches [6.4] for at least the same reasons as [1d]. §VII.A.2.e, *supra*.

f. Element [6.5]

The combination of DuroMax, Parlatore, and Elsdon teaches [6.5] for at least the same reasons as [1.5]. §VII.A.2.f, *supra*.

g. Element [6.6]

The combination of DuroMax, Parlatore, and Elsdon teaches [6.6]. The combination of DuroMax, Parlatore, and Elsdon teaches “a mechanical fuel valve actuatable between a first position and a second position to selectively control fuel flow to the dual fuel generator from the liquid fuel source through the liquid fuel line and the pressurized fuel source through the gaseous fuel line.” §VII.A.6.f, *supra*.

A POSA would have therefor understood that the combination of DuroMax, Parlatore, and Elsdon teaches “wherein mechanical fuel valve opens and closes the liquid fuel line to selectively control fuel flow from the liquid fuel source to the dual fuel generator; and further comprises” as recited in [6.6]. Ex.1003, [0224]

h. Element [6.7]

The combination of DuroMax, Parlatore, and Elsdon teaches [6.7]. Element [6.7] is substantially similar to [1.7], with the addition of the fuel lockout apparatus of [1.6].

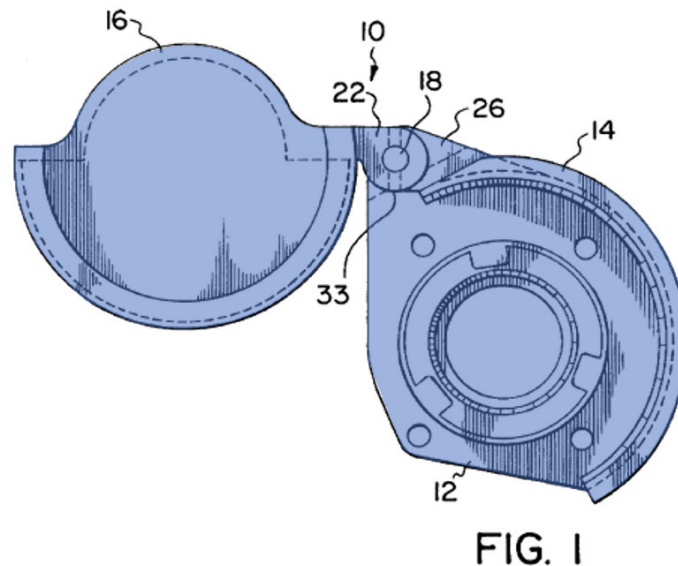
Element [6.7] (emphasis added)	Element [1.7] (emphasis added)
a fuel lockout apparatus coupled to the mechanical fuel valve and configured to prevent the pressurize fuel source from coupling to the gaseous fuel line while the mechanical fuel valve opens the liquid fuel line , and permit the pressurized fuel source to couple to the gaseous fuel line while the mechanical fuel valve closes the liquid fuel line .	wherein when the mechanical fuel valve is in the first position , the fuel lockout apparatus communicates the liquid fuel source to the dual fuel generator and prevents the pressurized fuel source from coupling to the dual fuel generator , and actuation of the mechanical fuel valve to the second position causes the fuel lockout apparatus to permit the pressurized fuel source to couple to the dual fuel generator, and interrupts the liquid fuel source communication with the dual fuel generator.

A POSA would have looked to the combination of DuroMax and Elsdon to teach a mechanical fuel valve is that rotatable between a first position in which the valve is opened (communicating the gasoline fuel source to the dual fuel engine) and a second position in which the valve is closed (interrupting communication of the gasoline fuel source to the dual fuel engine). Ex.1003, [0227]. The combination of DuroMax and Elsdon teaches a “fuel lockout apparatus coupled to [a] mechanical fuel valve.” §VII.A.2.g, *supra*. Accordingly a POSA would have

understood that the combination of DuroMax, Parlatore, and Elsdon teaches [6.7].
Ex.1003, [0228].

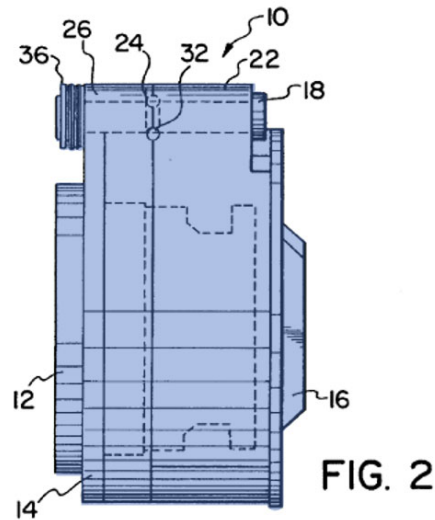
7. Claim 7

The combination of DuroMax and Elsdon teaches a fuel lockout apparatus comprising a cap and shield. §VII.A.2.g, *supra*. As seen in Fig. 1 of Elsdon (below), when the cap is in the open position the second fuel source (LPG) may be communicated to the internal combustion engine.



Ex.1005, Fig. 1 (Annotated).

As shown in Fig. 2 of Elsdon (below), when the cap is in the closed position, the second fuel source (LPG) is prevented from being communicated with the internal combustion engine.



Ex.1005, Fig. 2 (Annotated).

As described in §§VII.A.6.g-VII.A.6.h, *supra*, a POSA would have understood that operation of the mechanical fuel valve and the fuel lockout apparatus is interconnected such that only one fuel can be communicated to the engine at one time. Ex.1003, [0231].

Specifically, the mechanical fuel valve of DuroMax would be rigidly connected to the cap of Elsdon such that when the valve is rotated into a closed position interrupting the liquid fuel flow, the cap of Elsdon is moved into the open position and when the valve is rotated into an open position allowing liquid fuel to flow, the cap of Elsdon is moved into the closed position. A POSA would have therefore understood that when the fuel lockout apparatus of Elsdon is interconnected with the mechanical fuel valve of DuroMax, the mechanical fuel

valve would be prevented from moving into the first position when the pressurized fuel source communicates with the dual fuel engine (due to the cap coming into contact with the LPG input line). Ex.1003, [0233].

Accordingly, a POSA would have understood that the combination of DuroMax and Elsdon teaches claim 7. *Id.*

8. Claim 8

The combination of DuroMax and Elsdon teaches claim 8. The combination of DuroMax and Elsdon discloses a fuel lockout apparatus coupled to a mechanical fuel valve. §VII.A.2.g, *supra*. The fuel lockout apparatus includes a cap. *Id.* A POSA would have understood it to be obvious to have rigidly connected the DuroMax gasoline fuel valve to the cap of Elsdon such that the DuroMax valve handle and shaft rotate together with Elsdon cap 16. §VII.A.1, *supra*.

A POSA would have further considered it to be obvious to have arranged the mechanical fuel valve and cap assembly of DuroMax and Elsdon adjacent to the LPG input such that the cap of Elsdon rotates over and covers the LPG inlet (preventing coupling thereto) when the gasoline fuel valve is placed into an open position and uncovers the LPG inlet (permitting coupling thereto) when the gasoline fuel valve is placed into the closed position. §VII.A.1, *supra*.

Accordingly, the combination of DuroMax and Elsdon teaches claim 8.

9. Claim 9

The combination of DuroMax, Elsdon, and Parlature teaches the limitations of claim 6. Parlature and LP-Gas Handbook each teaches the additional limitations of dependent claim 9.

Parlature states that “the regulator arrangement of the primary regulator 106 and the secondary regulator 110 may be such that they are combined as a single, two-stage, regulator 202 would then feed the vaporized propane into carburetor 114 through hose 112.” Ex.1007, [0018]. LP-Gas Handbook also discloses that integral two-stage regulators were known in the art many years before the priority date of the ‘654 Patent. §II.B, *supra*. Thus, Parlature and LP-Gas Handbook each teaches the additional limitations of claim 9.

10. Claim 10**a. Element [10.0]**

To the extent the preamble is limiting, the combination of DuroMax and Parlature teaches [10.0] for at least the same reasons as [1.0]. §VII.A.2.a, *supra*.

b. Element [10.1]

DuroMax teaches [10.1] for at least the same reasons as [1.1]. §VII.A.2.b, *supra*.

c. Element [10.2]

The combination of DuroMax and Parlatore teaches [10.2] for at least the same reasons as [1.2]. §VII.A.2.c, *supra*.

d. Element [10.3]

The combination of DuroMax and Parlatore teaches [10.3] for at least the same reasons as [1.3]. §VII.A.2.d, *supra*.

e. Element [10.4]

The combination of DuroMax and Parlatore teaches [10.4] for at least the same reasons as [1.4]. §VII.A.2.e, *supra*.

f. Element [10.5]

Element [10.5] recites “wherein the generator is free of any pressure regulator.”

Parlatore discloses using its fuel delivery system with a generator, and there is no indication such a generator has its own regulator. Ex.1007, [0019]; Ex.1003, [0246]. In addition, Parlatore discloses that the secondary regulator (discussed in §VI.C, *supra*) can meter propane gas to an engine, further indicating that the engines and generators disclosed in Parlatore do not have their own pressure regulators. Ex.1007, [0016]; Ex.1003, [0246]. A POSA would have been motivated to use Parlature’s fuel delivery system with DuroMax and locate all pressure regulators off-board the generator. *Supra* §VII.A.1.

11. Claim 11

Parlatore states that “the regulator arrangement of the primary regulator 106 and the secondary regulator 110 may be such that they are combined as a single, two-stage, regulator 202.” Ex.1007, [0018]. “[T]he combined regulator 202 would then feed the vaporized propane into carburetor 114 through hose 112.” *Id.* An integral two-stage regulator 202 may be used “[i]n further exemplary embodiments” including the combined, two-stage regulator with the off-board embodiment shown in Fig 3. Ex.1007, [0018]; Fig. 3. A POSA would understand that the same mounting arrangement from Fig. 3 can be used with an integral two-stage regulator 202 (instead of separate regulators), thereby mounting the dual stage regulator on the pressurized fuel source. Ex.1003, [0247].

B. Ground 2: The Combination of Hallberg and Parlatore Renders Obvious Claims 1, 3-7, and 9-11.

Petitioners include Ground 2 showing how even under Patent Owner’s apparent construction of certain claim terms, claims 1, 3-6, and 9 of the ‘654 Patent are rendered obvious under §103 by the combination of Hallberg and Parlatore.

1. Motivation to Combine Hallberg and Parlatore, and POSA’s Reasonable Expectation of Success

Parlatore discloses a propane vapor delivery system. Ex.1007, [0013], Figs. 1-3. The propane vapor delivery system includes a first pressure regulator and a

second pressure regulator. *Id.* The LPG tank 300 can be located separate from, but coupled to, an engine 310. Ex.1007, [0020], Fig. 3.

Hallberg discloses a dual fuel engine configured to selectively operate on LPG or gasoline. §VI.E, *supra*. Hallberg discloses a mechanical fuel valve 300 and fuel lockout apparatus comprising fluid dual valve control 301 and control cable 302. §§VII.A.10.2.f-VII.A.10.2.h, *infra*. A POSA would have understood that the mechanical fuel valve and fuel lockout apparatus of Hallberg are configured to selectively control the flow of gasoline and LPG to the dual fuel engine. *Id.*; Ex.1003, [0251].

A POSA would have been motivated to combine Parlature's fuel regulator system, including its primary and secondary regulator, to provide gaseous LPG fuel to the engine at the desired pressure via a gaseous fuel line. Ex.1003, [0252]. Similarly, it would have been obvious to use Parlature's LPG tank 300 along with its service valve 316 with the internal combustion engine of Hallberg given that such LPG tanks having service valves were well known. *Id.* Moreover, it would have been obvious to a POSA to use the off-board fuel regulator system disclosed in Parlature, because Parlature discloses the use of a regulator system with "any desired form of engine" and specifically suggests the use of its regulator system with generators. Ex.1007, [0019], [0025]; *see also id.*, [0024] (suggesting off-board configuration "where more fuel may be desired"); Ex.1003, [0253]. A

POSA would have been motivated to utilize such an off-board regulator system to provide safety and serviceability benefits. *Supra* §VII.A.1.

A POSA would have had a reasonable expectation of success in using Hallberg. Ex.1003, [0254]. As of the priority date of the '654 Patent, dual fuel engines were well known in the art, with Hallberg being just one example. Combining the off-board fuel regulator system of Parlatore with the dual-fuel system disclosed by Hallberg would have involved nothing more than using Parlatore's LPG tank configuration as the LPG fuel source for the Hallberg dual fuel system with each performing their intended function without any unexpected results. *Id.*

A POSA would have therefore reasonably expected that off-board fuel regulator system of Parlatore could be successfully implemented with the dual fuel generator of Hallberg. Ex.1003, [0255].

2. Claim 1

a. Element [1.0]

To the extent the preamble is limiting, Hallberg teaches [1.0]. Hallberg discloses a system which may be used with conventional internal combustion engines to permit alternative utilization of a liquified gas fuel such as propane and a liquid fuel such as gasoline. Ex.1006, 3:49-55.

A POSA would understand that the system of Hallberg is a dual fuel engine, such as that which is used in a dual fuel generator, and fuel delivery system. Ex.1003, [0257]. It would have been obvious to have implemented such an engine into a generator, such as a generator described by Parlato. Ex. 1007, ¶[0019]; Ex. 1003, [0257].

b. Element [1.1]

Hallberg teaches [1.1]. Hallberg discloses that gasoline is provided to the dual fuel engine by way of the carburetor (e.g. “gasoline from gasoline supply line 304 is supplied to the carburetor 110 through engine gasoline line 305.”) Ex.1006, 7:36-43. Propane is supplied to the dual fuel engine by way of the mixer (“the mixer 100 admits pressurized gaseous fuel to the engine.”) Ex.1006, 8:56-60. The propane is stored in a pressurized fuel tank (“[l]iquidified petroleum gas, propane and the other ‘gaseous’ fuels with which the present invention is intended to be used are normally held for use in a reservoir or tank under sufficient pressure and at a temperature such that the fuels are in a liquid state.”) Ex.1006, 1:54-58.

Accordingly, a POSA would have understood that the liquid fuel source provides liquid fuel from a liquid fuel tank to the dual fuel engine and the pressurized fuel source provides gaseous fuel from a pressurized fuel container to the dual fuel engine. Ex.1003, [0259].

c. Element [1.2]

Hallberg discloses a LPG regulator system but does not indicate whether the regulator system is “off-board.” Ex.1006, 6:65-7:8, 8:31-9:61. Parlature discloses a fuel regulator system located off board the dual fuel generator. §VII.A.2.c, *supra*.

A POSA would have been motivated to use Parlature’s “off-board” regulator system shown in Fig. 3 with a generator having Hallberg’s dual-fuel engine and would have had a reasonable expectation of success. Ex.1003, [0260]. A POSA would have recognized the user may have only LPG available at any given time, thus the user would want a large, off-board tank to run the generator for a sufficient period of time, such as a long outage due to a storm. Ex.1003, [0262].

A POSA would therefore understand that the combination of Hallberg and Parlature teaches [1.2].

d. Element [1.3]

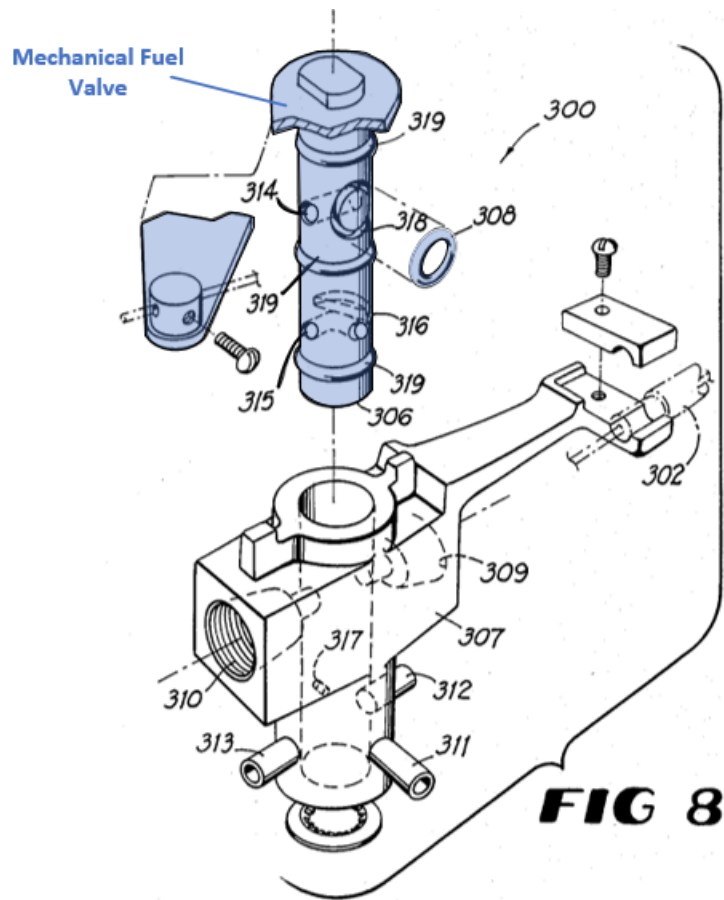
The combination of Hallberg and Parlature teaches [1.3]. Parlature teaches [1.3] for at least the same reasons as discussed in §VII.A.2.d, *supra*.

e. Element [1.4]

The combination of Hallberg and Parlature teaches [1.4]. Parlature teaches [1.4] for at least the same reasons as discussed in §VII.A.2.e, *supra*.

f. Element [1.5]

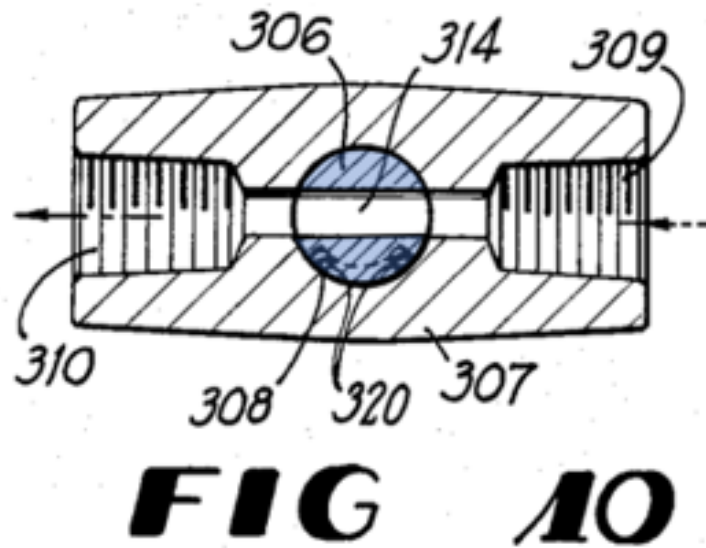
The combination of Hallberg and Parlatore teaches [1.5]. Hallberg discloses a mechanical fuel valve as shown in Fig. 8 below (“[i]n the figures...300 is the fluid dual valve structure.” Ex.1006, 7:5-7).



Ex.1006, Fig. 8 (Emphasis Added).

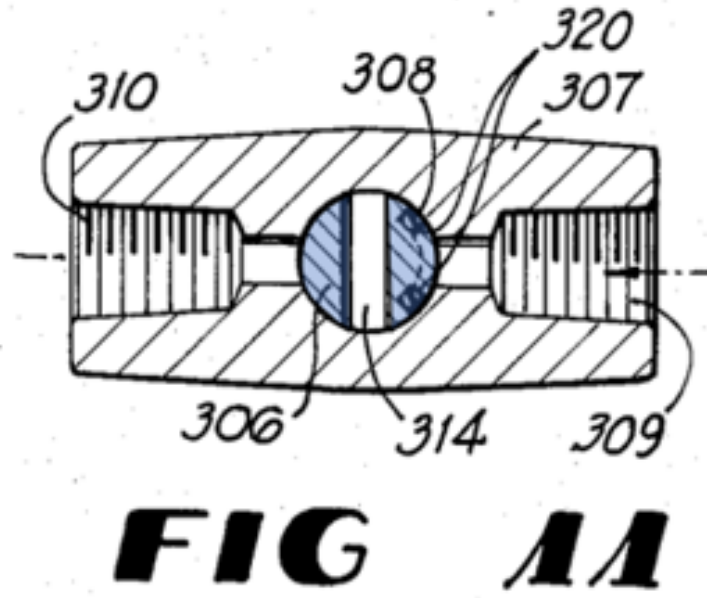
Positioning of control 301 in “gasoline” mode acts through control cable 302 to rotate spool 306 within valve body 307 such that gasoline from gasoline supply line 304 is supplied to the carburetor 110 and the flow of propane is locked out. Ex.1006, 7:27-40. As shown in Fig. 10 below, when the mechanical fuel valve is

in gasoline mode, liquid inlet opening 309 and liquid outlet opening 310 communicate through tunnel 314. Ex.1006, 7:40-7:43. A POSA would have thus understood that the mechanical fuel valve is actuatable to a first position to selectively control fuel flow to the dual fuel engine from a liquid fuel source through a first fuel line. Ex. 1003, [0267].



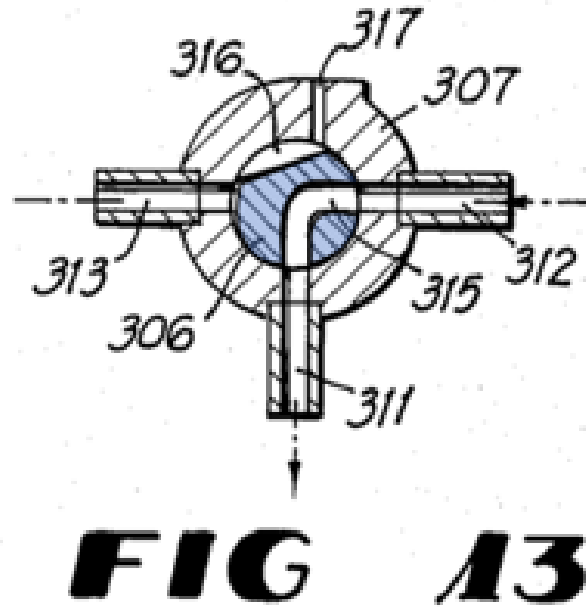
Ex.1006, Fig. 10 (Emphasis Added).

As shown in Fig. 11 (below) when “propane” mode of control 301 is selected, spool 306 is rotated within valve body 307 by control cable 302 such that O-ring 308 on the face of spool 306 forms a seal between spool 306 and valve body 307 around liquid inlet opening 309. Ex.1006, 8:3-7. Forming a seal between the spool 306 and valve body 307, prohibits the flow of gasoline to conventional carburetor 110. Ex.1006, 8:7-10.



Ex.1006, Fig. 11 (Emphasis Added).

However, as shown in Fig. 13 (below), during “propane” mode operation, duct 315 within spool 306 is simultaneously aligned to communicate with vacuum inlet port 311 and first vacuum outlet port 312. Ex.1006, 8:23-26, Fig. 13. Communicating vacuum inlet port 311 with the first vacuum outlet port 314 connects converter vacuum line 30 (shown in Fig. 1) to the intake manifold, via intake manifold line 112. Ex.1006, 8:26-30.



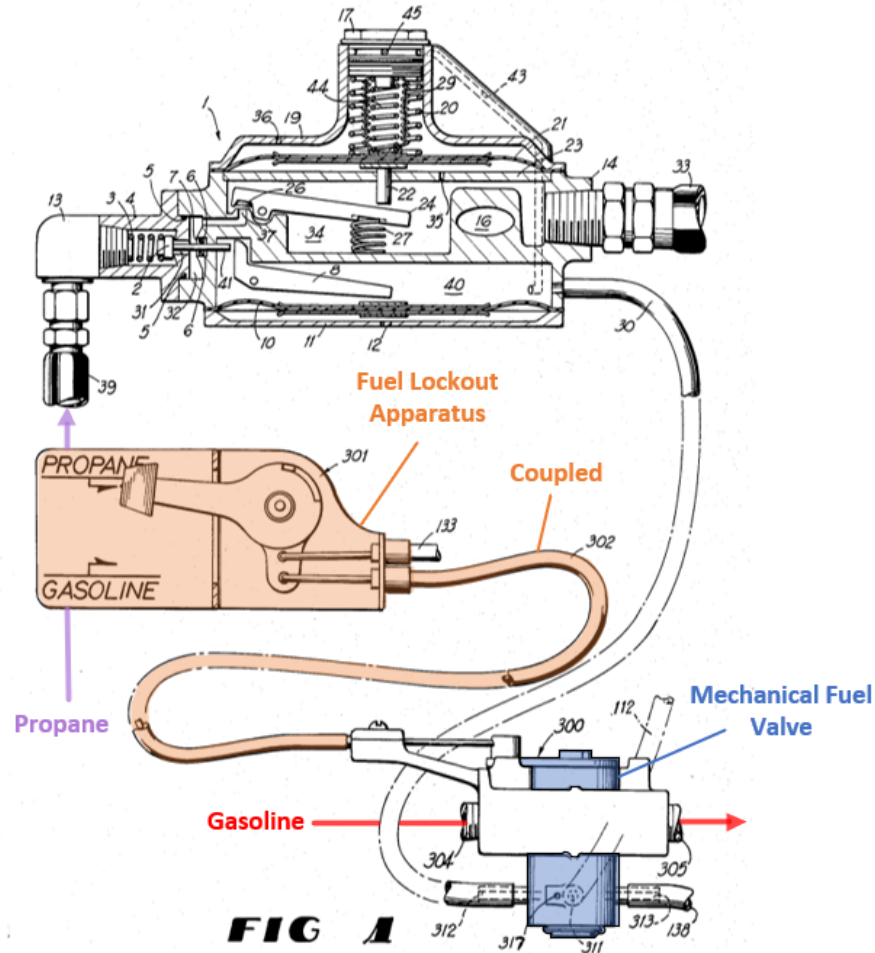
Ex.1006, Fig. 13 (Emphasis Added).

When the engine is started, a vacuum is created in line 30, urging diaphragm 10 upward against liquid inlet lever 8. Ex.1006, 8:31-38. Actuating inlet lever 8 drives inlet valve shaft 41 against bias spring 3 which opens liquid inlet valve 2 allowing propane to flow through the propane fuel line to the engine. Ex.1006, 8:38-42.

A POSA would have understood that the mechanical fuel valve is thus actuateable between a first position (e.g., gasoline) and a second position (e.g., propane) to selectively control fuel flow to the dual fuel engine from a liquid fuel source through a first fuel line and a pressurized fuel source through a second fuel line as recited in [1.5]. Ex.1003, [0271].

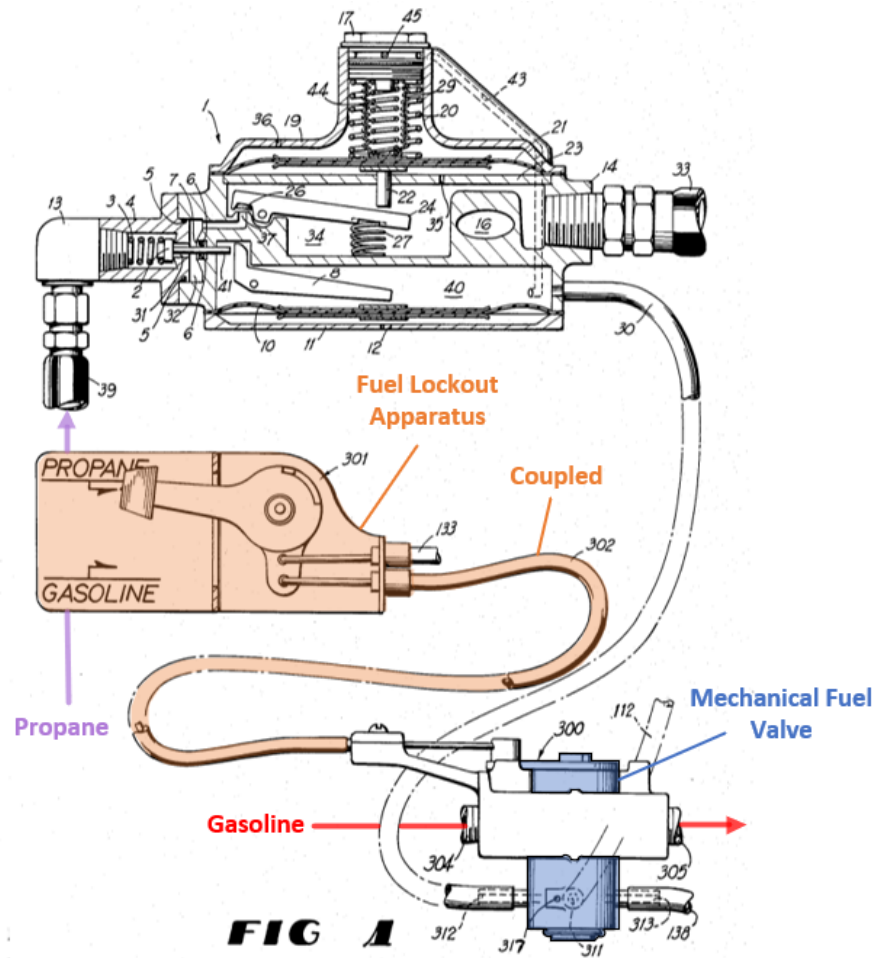
g. Element [1.6]

The combination of Hallberg and Parlatore teaches [1.6]. Hallberg discloses a mechanical fuel valve. §VII.A.10.2.f, *supra*. Hallberg also discloses a fuel lockout apparatus comprising fluid dual value control 301 and control cable 302. Ex.1006, 7:27-44; Ex.1003, [0272]. As shown in Fig. 1 (below), the fuel lockout apparatus comprising fluid dual value control 301 and control cable 302 is coupled to fluid dual valve structure 300. Ex.1006, 7: 30-36 and 8:3-9. Positioning control 301 in the “gasoline” mode acts through control cable 302 to permit gasoline to flow through fluid dual valve structure 300, and to lock out propane from flowing through fluid dual valve structure 300. Ex.1003, [0273]. Positioning control 301 in the “propane” mode acts through control cable 302 to permit propane to flow through fluid dual valve structure 300, and to lock out gasoline from flowing through fluid dual valve structure 300. *Id.*



Ex.1006, Fig. 1 (Emphasis Added).

Hallberg discloses that the fuel lockout apparatus is coupled to the mechanical fuel valve. As shown in Fig. 1 (below), control cable 302 couples the fuel lockout apparatus comprising fluid dual valve control 301 and control cable 302 to the mechanical fuel valve. Without control cable 302, the fluid dual valve control 301 would be unable to rotate spool 306 within the valve body 307. Ex.1006, 7:30-33.

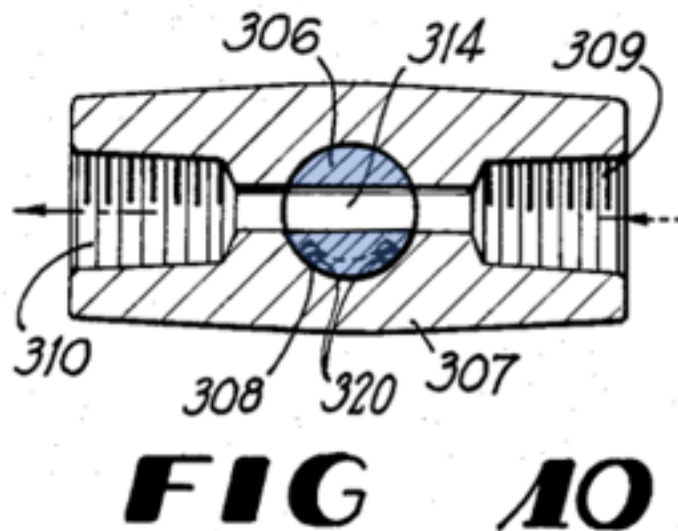


Ex.1006, Fig. 1 (Emphasis Added).

Accordingly, a POSA would have understood that Hallberg teaches a fuel lockout apparatus coupled to the mechanical fuel valve as recited in [1.6]. Ex.1003, [0275].

h. Element [1.7]³

The combination of Hallberg and Parlatore teaches [1.7]. Hallberg discloses that when gasoline is selected on the fluid dual valve control 301, spool 306, within valve body 307, is rotated such that gasoline from gasoline supply line 304 is supplied to the carburetor 110 through engine gasoline line 305. Ex.1006, 7:27-44. As shown in Fig. 10 below, when gasoline is selected, gasoline is communicated through inlet opening 309, tunnel 314 and liquid outlet opening 310.



Ex.1006, Fig. 10 (Emphasis Added).

³ While Claim 1 discusses the “fuel lockout apparatus [communicating] the first fuel source” and “interrupting first fuel source communication,” the disclosure of the ’654 Patent associates this functionality with the mechanical fuel valve assembly. While Claim 1 appears to be invalid under 35 U.S.C. §112 as a result, to the extent it is construed to cover Patent Owner’s apparent claim construction, it is invalid over Hallberg.

During gasoline mode, the fuel lockout apparatus prevents the flow of propane to the internal combustion engine. §VII.A.10.2.g, *supra*. A POSA would have therefore understood that when the mechanical fuel valve is in the first position, the fuel lockout apparatus communicates the liquid fuel source to the dual fuel engine and prevents communication between the pressurized fuel source and the dual fuel engine. Ex.1003, [0277].

When propane mode is selected on the fluid dual valve control 301, propane is provided to the dual fuel engine. Ex.1006, 7:27-44. As described in §§VII.A.10.2.f-VII.A.10.2.g, *supra*, when propane mode is selected, spool 306 is rotated within valve body 307 to form a seal to prevent the flow of gasoline to the engine and a vacuum is created in line 30, urging diaphragm 10 upward against liquid inlet lever 8 which drives inlet valve shaft 41 against bias spring 3 which opens liquid inlet valve 2 allowing propane to flow through the propane fuel line to the engine. Ex.1003, [0278]. A POSA would have therefore also understood when the mechanical fuel valve is in a second position, the fuel lockout apparatus communicates the pressurized fuel source to the dual fuel engine and interrupts the liquid fuel source communication with the dual fuel engine. Ex.1003, [0279].

Accordingly, a POSA would have understood that combination of Hallberg and Parlatore teaches the limitations of [1.7]. Ex.1003, [0280].

3. Claim 3

The combination of Hallberg and Parlatores discloses claim 3. Parlatores discloses claim 3 for at least the same reasons discussed in §VII.A.3, *supra*.

4. Claim 4

The combination of Hallberg and Parlatores discloses claim 4. Parlatores discloses claim 4 for at least the same reasons discussed in §VII.A.4, *supra*.

5. Claim 5

The combination of Hallberg and Parlatores discloses claim 5. Parlatores discloses claim 5 for at least the same reasons discussed in §VII.A.5, *supra*.

6. Claim 6

a. Element [6.0]

The combination of Hallberg and Parlatores teaches the limitations of [6.0] for at least the same reasons as [1.0] in §VII.B.2.a, *supra*.

b. Element [6.1]

The combination of Hallberg and Parlatores teaches the limitations of [6.1] for at least the same reasons as [1.1] §VII.A.10.2.b, *supra*.

c. Element [6.2]

The combination of Hallberg and Parlatores teaches the limitations of [6.2] for at least the same reasons as [1.3] in §VII.A.10.2.c, *supra*.

d. Element [6.3]

The combination of Hallberg and Parlatore teaches the limitations of [6.3] for at least the same reasons as [1.3] in §VII.A.10.2.d, *supra*.

e. Element [6.4]

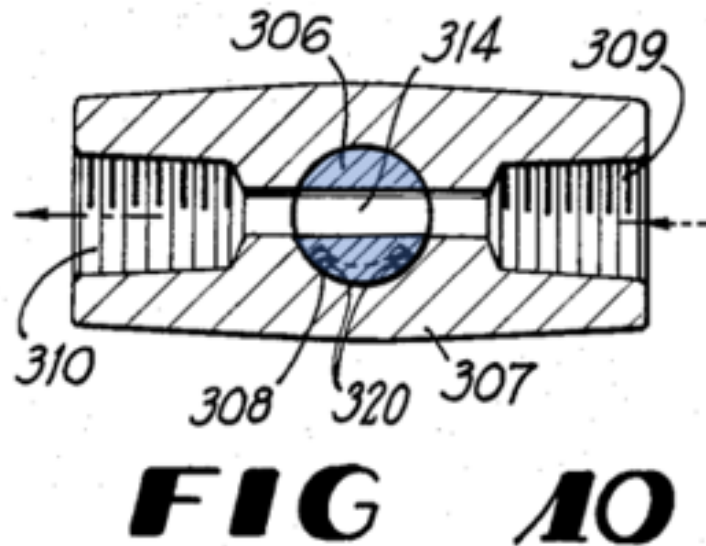
The combination of Hallberg and Parlatore teaches the limitations of [6.5] for at least the same reasons as [1.5] in §VII.A.10.2.e, *supra*.

f. Element [6.5]

The combination of Hallberg and Parlatore teaches the limitations of [6.5] for at least the same reasons as [1.5] in §VII.A.10.2.f, *supra*.

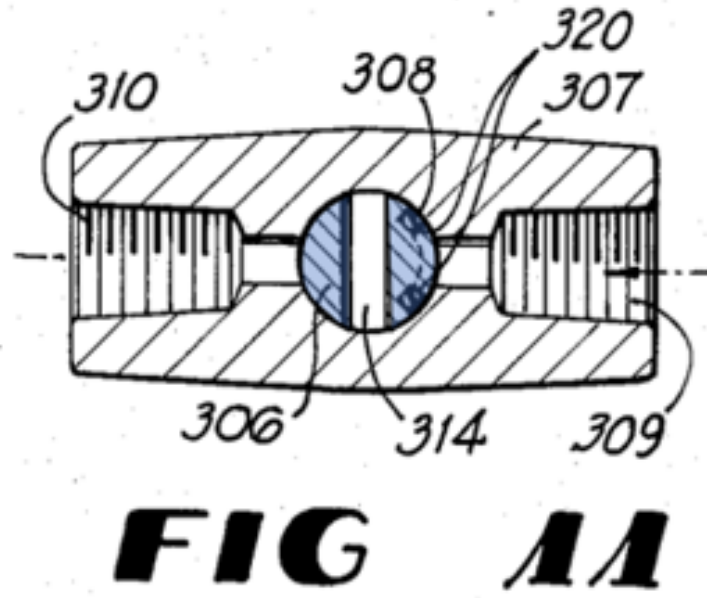
g. Element [6.6]

The combination Hallberg and Parlatore teaches [6.6]. As shown in Fig. 10 of Hallberg below, when the mechanical fuel valve is in gasoline mode, liquid inlet opening 309 and liquid outlet opening 310 communicate through tunnel 314. Ex.1006, 7:40-7:43. A POSA would have thus understood that the mechanical fuel valve is actuatable to a first position to selectively control fuel flow to the dual fuel engine from a liquid fuel source through a first fuel line.



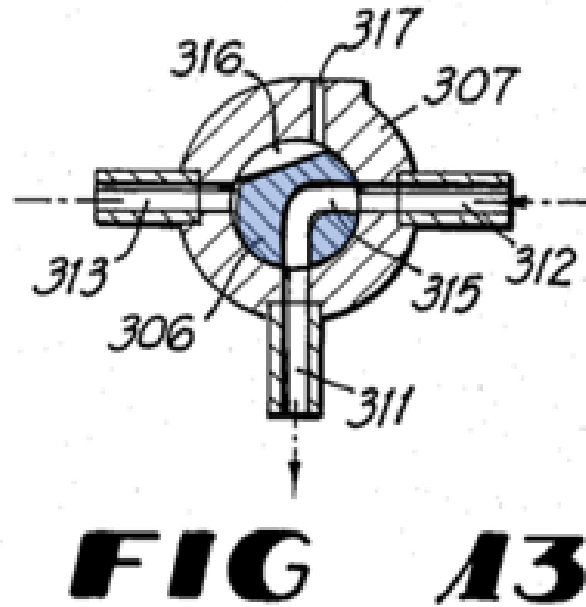
Ex.1006, Fig. 10 (Emphasis Added).

As shown in Fig. 11 (below) when “propane” mode of control 301 is selected, spool 306 is rotated within valve body 307 by control cable 302 such that O-ring 308 on the face of spool 306 forms a seal between spool 306 and valve body 307 around liquid inlet opening 309. Ex.1006, 8:3-7. Forming a seal between the spool 306 and valve body 307, prohibits the flow of gasoline to conventional carburetor 110. Ex.1006, 8:7-10.



Ex.1006, Fig. 11 (Emphasis Added).

However, as shown in Fig. 13 (below), during “propane” mode operation, duct 315 within spool 306 is simultaneously aligned to communicate with vacuum inlet port 311 and first vacuum outlet port 312. Ex.1006, 8:23-26, Fig. 13. Communicating vacuum inlet port 311 with the first vacuum outlet port 314 connects converter vacuum line 30 (shown in Fig. 1) to the intake manifold, via intake manifold line 112. Ex.1006, 8:26-30.



Ex.1006, Fig. 13 (Emphasis Added).

When the engine is started, a vacuum is created in line 30, urging diaphragm 10 upward against liquid inlet lever 8. Ex.1006, 8:31-38. Actuating inlet lever 8 drives inlet valve shaft 41 against bias spring 3 which opens liquid inlet valve 2 allowing propane to flow through the propane fuel line to the engine. Ex.1006, 8:38-42.

A POSA would have understood that the mechanical fuel valve is thus actuateable between a first position (e.g., gasoline) and a second position (e.g., propane) to selectively control fuel flow to the dual fuel engine from a liquid fuel source through a first fuel line and a pressurized fuel source through a second fuel line. Ex.1003, [0295].

h. Element [6.7]

The combination of Hallberg and Parlatore teaches element [6.7]. Hallberg discloses a fuel lockout apparatus comprising fluid dual value control 301 and control cable 302. §§VII.A.10.2.g-VII.A.10.2.h, *supra*. The fluid dual valve control 301 and control cable 302 can be actuated and/or engaged to allow either gasoline or propane to flow to the internal combustion engine. *Id.* Hallberg also discloses that the fuel lockout apparatus is coupled to the mechanical fuel valve. *Id.*

Positioning control 301 in the “gasoline” mode acts through control cable 302 to permit gasoline to flow through fluid dual valve structure 300, and to lock out propane from flowing through the propane fuel line to the engine. *Id.* Positioning control 301 in the “propane” mode acts through control cable 302 to permit propane to flow through the propane fuel line to the engine, and to lock out gasoline from flowing through fluid dual valve structure 300. *Id.*

7. Claim 7

Hallberg teaches a fuel lockout apparatus comprising fluid dual value control 301 and control cable 302. §VII.B.2.c, *supra*. When the “propane” mode of control 301 is selected, spool 306 is rotated within valve body 307 by control cable 302 such that O-ring 308 on the face of spool 306 forms a seal between spool 306 and valve body 307 around liquid inlet opening 309 (as shown in Fig. 11)

thereby prohibiting flow of gasoline to a conventional carburetor 110. Ex.1006, 8:3–10; Fig. 11. Accordingly, Hallberg teaches the additional limitations of claim 7.

8. Claim 9

The combination of Hallberg and Parlatores teaches the limitations of claim 9. Parlatores teaches that the primary and secondary pressure regulators are integral components of a dual stage pressure regulator for at least the same reasons as discussed in §VII.A.9, *supra*.

9. Claim 10

a. Element [10.0]

To the extent the preamble is limiting, the combination of Hallberg and Parlatores teaches [10.0] for at least the same reasons as [1.0]. §VII.B.2.a, *supra*.

b. Element [10.1]

Hallberg teaches [10.1] for at least the same reasons as [1.1]. §VII.B.2.b, *supra*.

c. Element [10.2]

The combination of Hallberg and Parlatores teaches [10.2] for at least the same reasons as [1.2]. §VII.B.2.c, *supra*.

d. Element [10.3]

The combination of Hallberg and Parlatore teaches [10.3] for at least the same reasons as [1.3]. §VII.B.2.d, *supra*.

e. Element [10.4]

The combination of Hallberg and Parlatore teaches [10.4] for at least the same reasons as [1.4]. §VII.B.2.e, *supra*.

f. Element [10.5]

Element [10.5] recites “wherein the generator is free of any pressure regulator.”

Hallberg does not indicate whether its pressure regulator system is located on or offboard. Parlatore discloses using its fuel delivery system with a generator, and there is no indication such a generator has its own regulator. Ex.1007, [0019]; Ex.1003, [0305]. In addition, Parlatore discloses that the secondary regulator (discussed in §VI.C) can meter propane gas to an engine, further indicating the engines and generators disclosed in Parlatore do not have their own pressure regulators. Ex.1007, [0016]; Ex.1003, [0305]. A POSA would have been motivated to combine the teachings of Hallberg and Parlatore to locate all pressure regulators off-board the generator. *Supra* §§VII.B.1, VII.B.2.c.

10. Claim 11

Parlatore states that “the regulator arrangement of the primary regulator 106 and the secondary regulator 110 may be such that they are combined as a single, two-stage, regulator 202.” Ex.1007, [0018]. “[T]he combined regulator 202 would then feed the vaporized propane into carburetor 114 through hose 112.” *Id.* An integral two-stage regulator 202 may be used “[i]n further exemplary embodiments” including the combined, two-stage regulator with the off-board embodiment shown in Fig 3. Ex.1007, [0018], Fig. 3.

A POSA would understand that the regulator system of Hallberg could be configured according to the mounting arrangement from Fig. 3 in an integral two-stage regulator 202 (instead of separate regulators), thereby mounting the dual stage regulator on the pressurized fuel source. Ex.1003, [0307].

C. Ground 3: Tri-fuel Video Anticipates Claims 10 and 11.**1. Claim 10****a. Element [10.0]**

The Tri-Fuel Video discloses a Honda EU 2000i generator.



Ex.1008, 0:14.

The Tri-Fuel Video also discloses a fuel delivery system. The Tri-Fuel Video explains that the Honda EU 2000i generator shown has been modified to alternatively run on gaseous fuel. Specifically, the Tri-Fuel Video shows that a propane tank supplies gaseous fuel to the Honda EU 2000i generator via a hose and releasable quick-connection. *Id.*, 1:26-1:58. The fuel from the propane tank is de-pressurized through a series of regulators. *Id.*, 2:00–3:23.



Id., 1:58 (annotated).



Id., 3:40 (annotated).



Id., 3:52 (annotated).

b. Element [10.1]

The Tri-Fuel Video explains that the Honda EU 2000i generator was modified to run on a separate gaseous fuel source, such as propane, rather than on gasoline only. *Id.*, 0:35-1:05 (explaining that the original carburetor was modified

by drilling a hole to “allow the propane or natural gas [to] get inside the carburetor if you want to use them instead of the gasoline”). The video shows that two regulators are attached to a separate propane tank for running the generator on propane. *Id.*, 1:57–2:15 (explaining that you “need two regulators”).



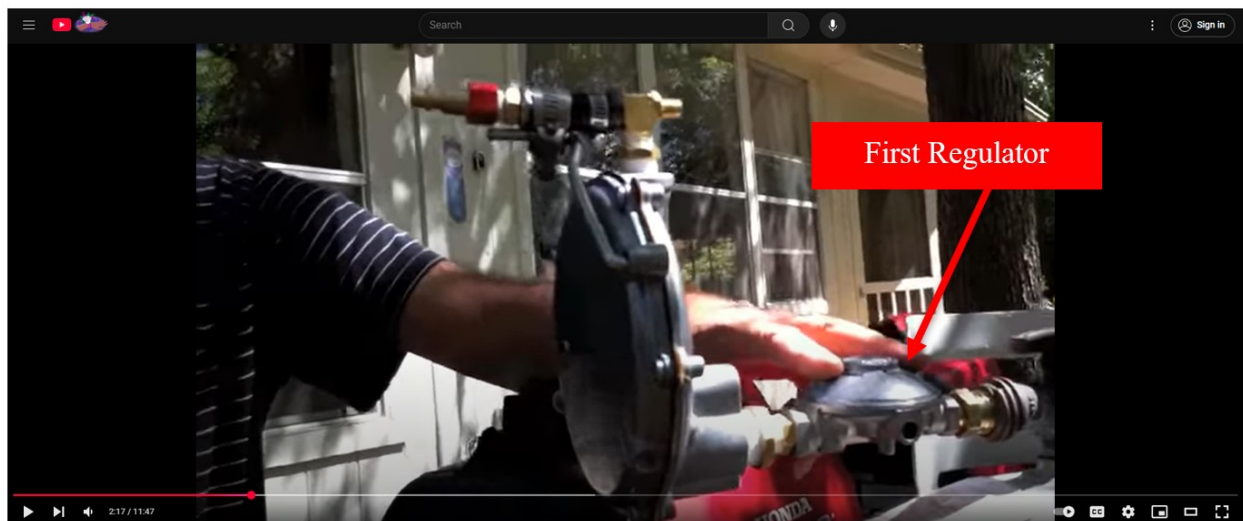
Id., 1:58 (annotated).

c. Element [10.2]

The Tri-Fuel Video explains that you “need two regulators” to adapt the Honda EU 2000i as shown in the video. *Id.*, 1:57–2:15. Specifically, the Tri-Fuel Video explains that the regulators work in stages: a first stage to lower the pressure of the pressurized gas to 0.5 psi, then a second stage to lower the gas further to around -0.5 water column. *Id.*, 2:13–2:57. The video shows the regulator system (comprising the two regulators) is located off-board the generator in that it is remote and not attached to the generator. *Id.*

d. Element [10.3]

The Tri-Fuel Video explains that you “need two regulators” to adapt the Honda EU 2000i as shown in the video. *Id.*, 1:57–2:15. Specifically, the Tri-Fuel Video explains that the regulators work in stages: a first stage to lower the pressure of the pressurized gas to 0.5 psi, then a second stage to lower the gas further to around -0.5 water column. *Id.*, 2:13–2:57. The video shows the regulator system (comprising the two regulators) is located off-board the generator in that it is remote and not attached to the generator. *Id.*



Id., 2:17.

e. Element [10.4]

The Tri-Fuel Video discloses a second regulator, as shown.



Id., 2:17 (annotated).

The Tri-Fuel video explains that the second regulator further reduces the gaseous fuel that is output from the first regulator. *See id.*, 2:24–3:23 (“The second regulator that is gonna be this one. The maximum input pressure that it can have is something around 11 water column that is gonna be every 27.5 water column is about 1 psi, so it’s approximately $\frac{1}{2}$ psi. The output of the second regulator has a pressure of the -0.5 water column, so it’s all the time is in a vacuum or suction mode. If the vacuum or suction does not exist these regulator automatically shut the gas off so that no gas is going through. So the way that it is right now it has some sort of safety built into it in case the engine or generator goes off or something happens to the hose or disconnected, the suction goes away, and this regulator shutting off the gas flow.”).

The Tri-Fuel Video shows that the generator is connected to the output of the second regulator. *Id.*, 3:36–3:53.



Id., 3:40 (annotated).



Id., 3:52 (annotated).

f. Element [10.5]

There is no indication the Honda EU 2000i generator had a regulator on-board the generator, before or after the modification. *See generally*, Ex.1008. The

unmodified generator operated exclusively on gasoline (which does not require a pressure regulator) and was modified to run on propane or natural gas (hence the name of the YouTube video as “Honda Generator Tri-Fuel, EU2000i Triple-Fuel”). Ex.1008, 0:35-1:05 (original carburetor was modified to run on gas), 3:55-4:05 (the choke must be used when running on gasoline), 7:35-8:15 (explanation for running the generator on gasoline). Ex.1003, [0316].

2. Claim 11

The Tri-Fuel Video discloses “a dual stage regulator configured to regulate the gaseous fuel supplied from the pressurized fuel source and regulate the reduced pressure gaseous fuel, wherein the dual stage regulator is mounted directly onto the pressurized fuel source, off-board from the generator.” §§VII.B.9.1.c-VII.B.9.1.f, *supra*.

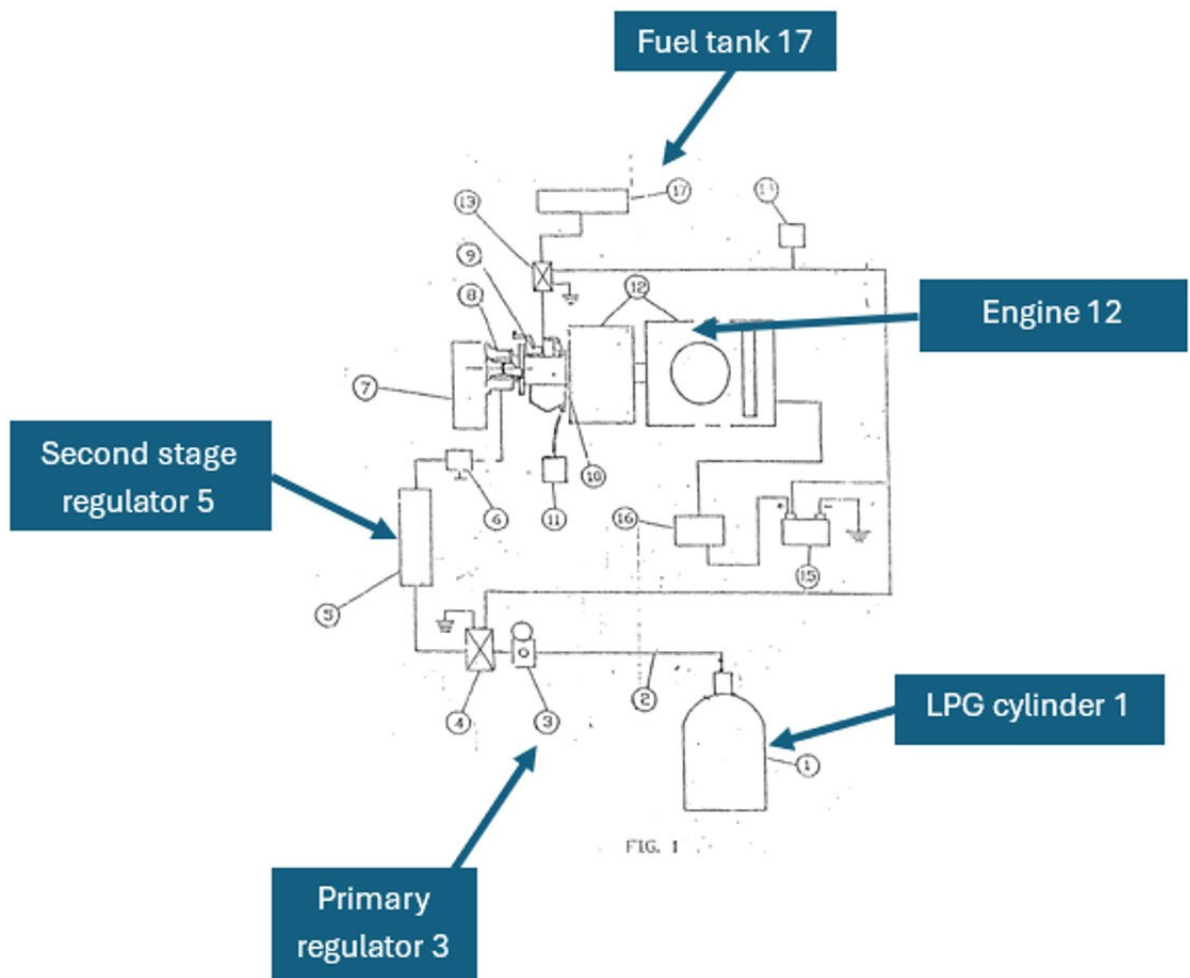
D. Ground 4: Chaudhari Anticipates Claims 10 and 11.

1. Claim 10

a. Element [10.0]

Chaudhari discloses a LPG fuel delivery system for use with a generator: “the present invention relates to a system for supplying Liquefied Petroleum Gas (LPG) to bi-fuel stationary engines in response to the load and speed of the engine, such engines preferably being coupled to a portable generator.” Ex.1010, p.4.

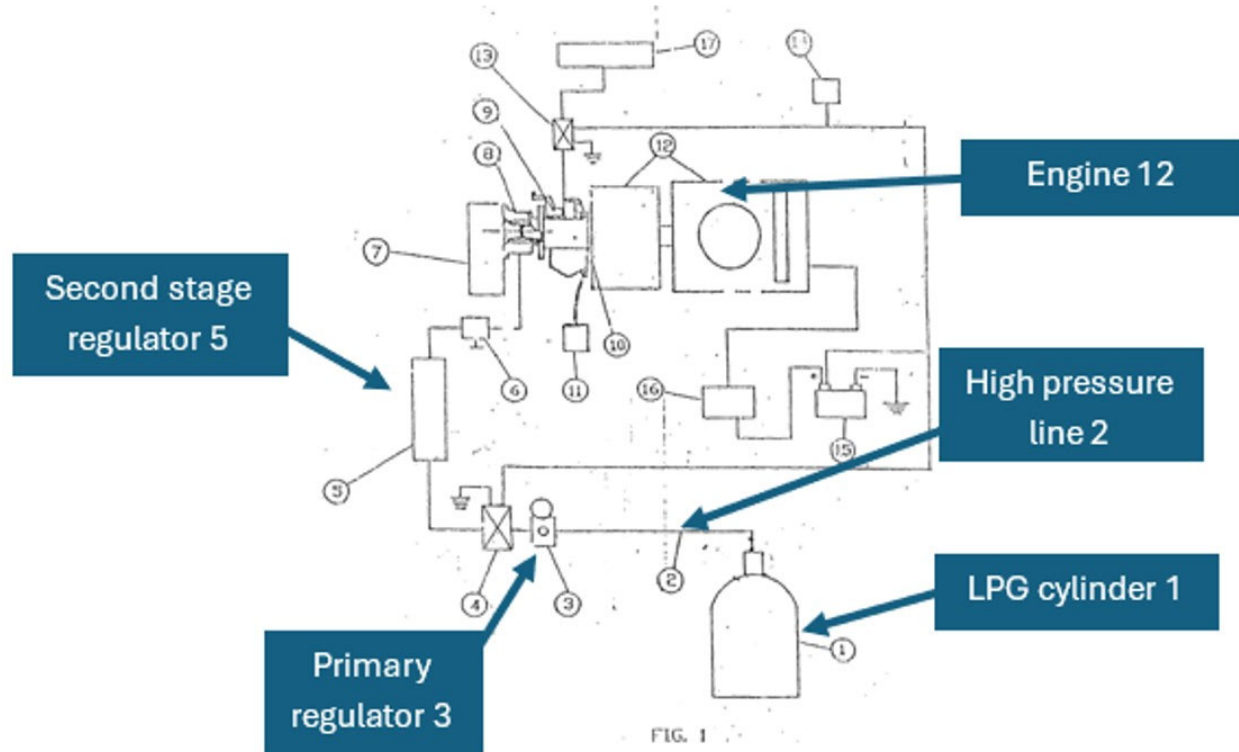
Chaudhari describes using this LPG supply system with a generator that runs on gasoline or kerosene stored in a tank 17. *Id.*, 7, Fig. 1. Therefore, Chaudhari discloses a dual-fuel generator, configured to run alternatively on LPG and gasoline or kerosene. *Id.*



Id., Fig. 1 (annotated).

b. Element [10.1]

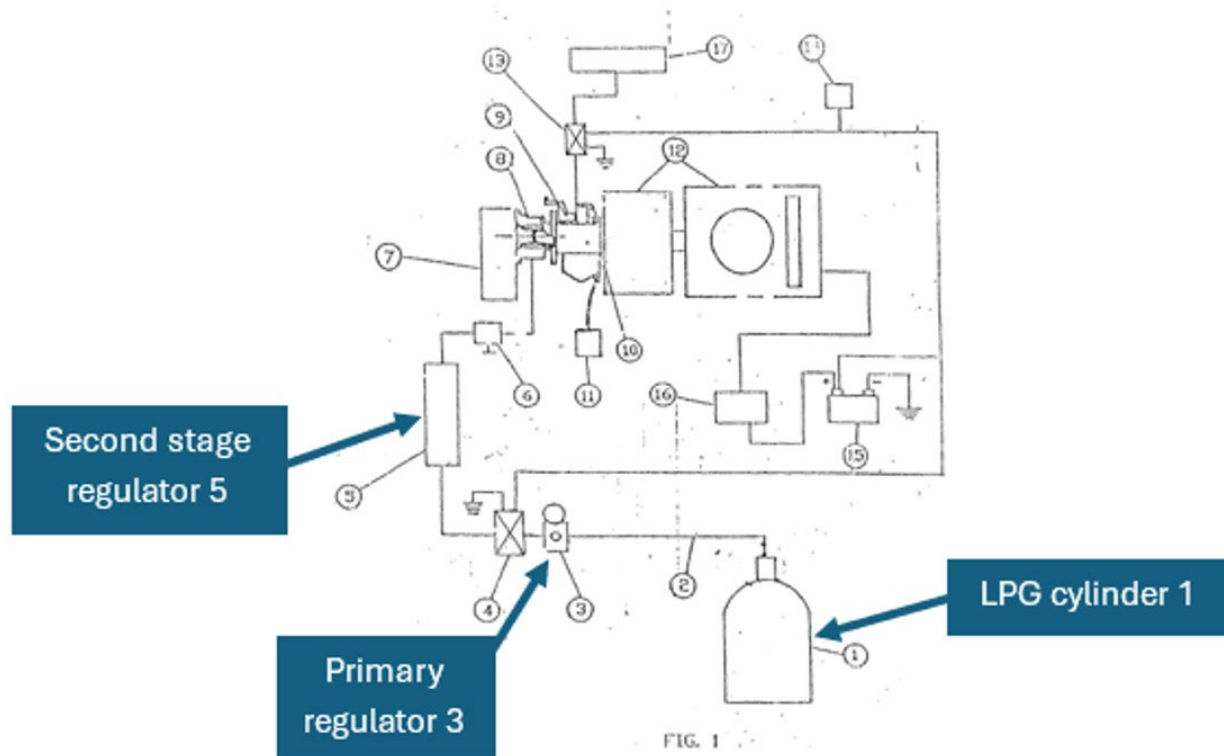
Chaudhari discloses the engine 12 of the generator is configured to operate on a gaseous fuel (LPG) supplied from a pressurized fuel source (LPG cylinder) when connected to the fuel supply system. *Id.* The LPG is supplied through a gaseous fuel line, including high pressure line 2. *Id.* It is inherent that the LPG source is pressurized because: (1) LPG cylinders are pressurized, as acknowledged in claim 1 requiring “a fuel cylinder for storing a predetermined quantity of Liquefied Petroleum Gas under pressure,” and (2) Chaudhari discloses the use of pressure regulators and a high-pressure line to reduce the pressure of LPG from the cylinder. *Id.*; Ex.1003, [0320].



Ex.1010, Fig. 1 (annotated).

c. Element [10.2]

Chaudhari discloses a fuel regulator system located off-board the generator. *Id.*, 4-5 (describing the fuel delivery system as an improved “Add-On” system), Fig. 1; Ex.1003, [0321]. Chaudhari discloses a first stage regulator 3 and second stage regulator 5. *Id.*, 7-8, Fig. 1.



Id., Fig. 1 (annotated).

d. Element [10.3]

Chaudhari discloses the first stage regulator 3 regulates LPG supplied from the LPG cylinder to a reduced pressure. *Id.*, p.7, Fig. 1.

e. Element [10.4]

Chaudhari discloses the second stage regulator 5 regulates LPG from the first stage regulator 3 down to a desired pressure for supply through the gaseous fuel line (the line connecting the second stage regulator to the engine) to operate the generator. *Id.*, 7, Fig. 1; Ex.1003, [0323].

f. Element [10.5]

Chaudhari discloses an improved “Add-On” fuel supply system for use with an existing generator. *Id.*, 4-5. Chaudhari does not disclose a regulator on-board the generator, because the generator (without the Add-On) operates only on kerosene or gasoline, which do not require a pressure regulator. *Id.*, 7; Ex.1003, [0324]. The only regulators disclosed in Chaudhari are part of the “Add-On” fuel supply system, which is separate from the generator. Ex.1010, 7-8, Fig. 1.

2. Claim 11

Chaudhari discloses “a dual stage regulator configured to regulate the gaseous fuel supplied from the pressurized fuel source and regulate the reduced pressure gaseous fuel, wherein the dual stage regulator is mounted directly onto the pressurized fuel source, off-board from the generator.” §§VII.D.1.c-VII.D.1.f, *supra*.

E. Ground 5: Claim 2 is Obvious in View of DuroMax, Parlatore, Elsdon, and LP-Gas Handbook, and alternatively, Hallberg, Parlature, and LP-Gas Handbook.

1. Claim 2

Claim 2 depends from claim 1.

Claim 1 is obvious in view of the combination of DuroMax, Parlature, and Elsdon. §VII.A.2, *supra*. Even under Patent Owner’s apparent construction of certain claim terms, claim 1 is obvious in view of the combination of Hallberg and Parlature. §VII.B.2, *supra*.

LP-Gas Handbook provides the limitations of claim 2 that are not supplied by DuroMax, Parlature, and Elsdon, or alternatively, Hallberg and Parlature. LP-Gas Handbook discloses the use of quick-connect couplings in LP-gas systems. Ex. 1009, 40 (§3.3.62 commentary: “Quick connectors are also used in other LP-Gas systems, such as those used for engine fuel refueling and cylinder filling, connecting cylinders to gas-fired barbecue grills, and connecting gas systems between two sections of mobile homes.”).

In view of the teachings of the LP-Gas Handbook, it would have been obvious to a POSA to use a quick-connect hose coupling at each end of a hose that couples an outlet of the secondary pressure regulator to an inlet of a gaseous fuel line of a dual fuel generator. Ex.1003, [0330].

VIII. MANDATORY NOTICES**A. Real Party in Interest**

In addition to Petitioners, Midwest Equipment Sales, LLC, Harbor Freight Holdings, Inc., and Generac Holdings, Inc., are listed as potential real-parties-in-interest.

B. Related Matters

To the best of Petitioners' knowledge, the '654 Patent is or has been involved in the following district court litigations/proceedings:

Name	Number	Court	Filed
<i>Champion Power Equipment Inc. v. Firman Power Equipment Inc.</i>	2:23-cv-02371	DAZ	Nov. 10, 2023
<i>Champion Power Equipment Inc. v. Generac Power Systems Inc.</i>	2:24-cv-01281	EDWI	Oct. 9, 2024
<i>Harbor Freight Tools USA Inc. v. Champion Power Equipment Inc.</i>	2:24-cv-8722	CDCA	Oct. 9, 2024
<i>Champion Power Equipment Inc. v. Harbor Freight Tools USA Inc.</i>	2:24-cv-01302	EDWI	April 29, 2025

Patent Owner has asserted the '654 Patent, and related 10,221,780 ('780 Patent), 10,393,034 ('034 Patent), 10,697,398 ('398 Patent), 11,143,120 ('120 Patent), 11,143,145 ('145 Patent), 11,492,985 ('985 Patent), and 11,840,970 ('970 Patent), as well as other non-family member patents, in *Champion Power Equipment Inc. v. Firman Power Equipment Inc.*, 23-cv-02371-DWL (D. Ariz.).

Patent Owner has asserted the '654 Patent and related '398 Patent, '120 Patent, '145 Patent, '985 Patent, '970 Patent, '780 Patent, as well as other non-family member patents, in *Champion Power Equipment Inc. v. Generac Power Systems Inc.*, 24-cv-01281-LA (E.D. Wis.).

Petitioner Harbor Freight has filed a declaratory judgment action alleging non-infringement of the '654 Patent and related '034 Patent, '985 Patent, '398 Patent, '120 Patent, '145 Patent, '970 Patent, '780 Patent, as well as other non-family member patents, in *Harbor Freight Tools USA, Inc. v. Champion Power Equipment, Inc.*, 24-cv-08722-SVW-AS (C.D. Cal.).

Patent Owner asserted the '654 Patent, and related '034 Patent, '398 Patent, '120 Patent, '145 Patent, '985 Patent, '970 Patent, '780 Patent, as well as other non-family member patents, against Petitioner Harbor Freight in *Champion Power Equipment Inc. v. Harbor Freight Tools USA Inc.*, 24-cv-01302- PP (E.D. Wis.). This case was dismissed on April 29, 2025, in favor of the earlier filed action in C.D. California cited above.

C. Lead and Back-Up Counsel Under 37 C.F.R. §42.8(b)(3)

Pursuant to 37 C.F.R. §§42.8(b)(3) and 42.10(a), Petitioners provide the following designation of counsel, to which all correspondence should be addressed. Pursuant to 37 C.F.R. §42.10(b), a Power of Attorney for each Petitioner accompanies this Petition.

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D. Service Information Under 37 C.F.R. §42.8(b)(4)

Please address all correspondence and service to the addresses listed above.

Petitioners consent to electronic service by email at:

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Petitioners also consent to electronic service directed to the aforementioned email addresses.

E. Payment of Fees

The Office is authorized to charge fees for this Petition to Deposit Account No. 09-0007. Any additional fees that might be due are also authorized.

IX. CONCLUSION

Petitioners respectfully request that the Board institute an *inter partes* review trial for Claims 1–11 of the '654 Patent to cancel these claims as unpatentable.

September 3, 2025

Respectfully submitted,

/Thomas A. Walsh/
Thomas Walsh, Reg. No. 45,196

CERTIFICATE OF WORD COUNT UNDER 37 CFR §42.24

I hereby certify that the foregoing Petition for *Inter Partes Review* of U.S. Patent No. 11,530,654 complies with the type-volume limitations of 37 CFR §42.24 and general format requirements of CFR §42.6(a).

The foregoing Petition for *Inter Partes Review* of U.S. Patent No. 11,530,654 includes 12,828 words (as calculated by Microsoft Word), excluding those in the table of contents, table of authorities, mandatory notices, certificate of service, certificate of word count, and appendix of exhibits. The Petition for *Inter Partes Review* of U.S. Patent No. 11,530,654 has also been prepared using Microsoft® Word in 14-point Times New Roman.

September 3, 2025

Respectfully submitted,

/Thomas A. Walsh/

Thomas Walsh, Reg. No. 45,196

CERTIFICATE OF SERVICE

Pursuant to 37 CFR §§42.6(e)(4)(i) *et. seq.* and 42. 105(b), I hereby certify on September 3, 2025, that a true and correct copy of the Petition for *Inter Partes Review* of U.S. Patent No. 11,530,654 was served in its entirety via e-mail and courier service to the Patent Owner by serving the correspondence address of record for the 11,530,654 Patent:

ZIOLKOWSKI PATENT SOLUTIONS GROUP, SC (ZPS)
136 S WISCONSIN ST
PORT WASHINGTON, WI

Courtesy copies of the same documents were served electronically on Patent Owner's litigation counsel by email at the following address:

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