

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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

v.

CHAMPION POWER EQUIPMENT, INC.,

Patent Owner.

Patent No. 11,840,970

Issued: Dec. 12, 2023

Title: DUAL FUEL GENERATOR WITH REMOTE REGULATOR

Inter Partes Review No. IPR2025-01463

PETITION FOR *INTER PARTES* REVIEW

U.S. Patent No. 11,840,970

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EXHIBIT LIST

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1001	U.S Patent No. 11,840,970 to Sarder et al. (“the ’970 Patent”)
1002	File History for U.S. Patent No. 11,840,970 (“the ’970 File History”)
1003	Declaration of Dr. Timothy Morse
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	Tri-Fuel YouTube Video (https://www.youtube.com/watch?v=DpknaAPTQ9U) (“Tri-Fuel Video”)
1008	Indian Patent No. 207333 (“Chaudhari”) (certified)
1009	<i>American Heritage Dictionary of the English Language</i> (3d ed. 1996) (excerpted)
1010	U.S. Patent Publication No. 2011/0100335 (“Parlatore”)
1011	Champion’s Claim Construction Brief CV-23-2371-PHX-DWL
1012	Declaration of David Raskin (dated May 7, 2025)
1013	https://www.youtube.com/watch?v=Ip7ckWAZ3xQ
1014	Declaration of Mr. John Ley re Tri-Fuel Video
1015	Declaration of Mr. Jared Bennett re Tri-Fuel Video

Exhibit No.	Description
1016	2-Stage Regulator Assembly (“2-Stage Assembly”) with WayBack Machine certification
1017	LP-Gas Code Handbook, Eighth Edition, Lemoff, Theodore C., (2008) (excerpted) (“LP-Gas Handbook”)
1018	Champion’s Infringement Contentions with Respect to Petitioner Harbor Freight’s Model 70143 Generator
1019	Application Details for Indian Patent No. 207333 (Chaudhari)
1020	Excerpts of File History for U.S. Patent No. 10,221,780 (“the ’780 File History”)
1021	U.S. Patent Pub. No. 2014/0239645 (“Jungmann”)
1022	U.S. Patent Pub. No. 2014/0202430 (“Monros”)
1023	U.S. Patent No. 5,172,723 (“Sturgis”)
1024	Weber Summit Gas Grill, Natural Gas Grill Owner’s Guide (dated February 28, 2011)
1025	Char-Broil Natural Gas Conversion Kit Model #4984619 (dated September 29, 2007)
1026	U.S. Patent No. 8,517,718 (“Deng”)

CLAIM LISTING

Element	Claim Language
[1.0]	A dual fuel generator and fuel delivery system comprising:
[1.1]	a dual fuel generator comprising: an engine 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, and
[1.2]	a carburetor attached to an intake of the engine to mix air and fuel and connect the liquid fuel line to the intake;
[1.3]	a fuel regulator system located off board the dual fuel generator, the fuel regulator system comprising:
[1.4]	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
[1.5]	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
[1.6]	a mechanical fuel valve actuatable between a first position and a second position to selectively control fuel flow to the engine from the liquid fuel source through the liquid fuel line and the pressurized fuel source through the gaseous fuel line.
2	The dual fuel generator and fuel delivery system of claim 1 wherein the carburetor connects the gaseous fuel line to the intake.

Element	Claim Language
[3.1]	The dual fuel generator and fuel delivery system of claim 1 further comprising a fuel lockout apparatus coupled to the mechanical fuel valve; and
[3.2]	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.
[4.1]	The dual fuel generator and fuel delivery system of claim 1, wherein the 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:
[4.2]	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.
5	The dual fuel generator and fuel delivery system of claim 4, 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.

Element	Claim Language
6	The dual fuel generator and fuel delivery system of claim 4, 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.
7	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.
8	The dual fuel generator and fuel delivery system of claim 1, further comprising a regulator mounting device fixed to the pressurized fuel source with at least the secondary pressure regulator mounted on the regulator mounting device.
9	The dual fuel generator and fuel delivery system of claim 8, wherein the primary pressure regulator is mounted on the regulator mounting device.
10	The dual fuel generator and fuel delivery system of claim 9, wherein the pressurized fuel source comprises a pressurized fuel container having a collar; and wherein the regulator mounting device fixes to the collar so that the primary and secondary pressure regulators are positioned adjacent each other along an outer periphery of the collar.

Element	Claim Language
11	The dual fuel generator and fuel delivery system of claim 1, wherein the primary and secondary pressure regulators are integral components of a dual stage pressure regulator.
[12.0]	A dual fuel generator and fuel delivery system comprising:
[12.1]	a dual fuel generator comprising: a generator housing, an alternator mounted within the generator housing, and an engine driving the alternator and mounted within the generator housing, the engine 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;
[12.2]	a fuel regulator system located off board the dual fuel generator, the fuel regulator system configured to:
[12.3]	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
[12.4]	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 dual fuel generator; and
[12.5]	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;

Element	Claim Language
[12.6]	wherein the dual fuel generator is free of any pressure regulator mounted within the generator housing.
13	The dual fuel generator and fuel delivery system of claim 12 wherein the mechanical fuel valve is mounted on or within the generator housing.
[14.1]	The dual fuel generator and fuel delivery system of claim 12 wherein the first stage comprises a primary pressure regulator coupled to a service valve of the pressurized fuel source and configured to regulate the gaseous fuel supplied from the pressurized fuel source to the reduced pressure; and
[14.2]	wherein the second stage comprises a secondary pressure regulator coupled to the primary pressure regulator and configured to regulate the gaseous fuel supplied from the primary pressure regulator to the desired pressure for delivery through the gaseous fuel line to operate the dual fuel generator.
15	The dual fuel generator and fuel delivery system of claim 14 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.
16	The dual fuel generator and fuel delivery system of claim 14, further comprising a regulator mounting device fixed to the pressurized fuel source with at least one of the primary pressure regulator and the secondary pressure regulator mounted on the regulator mounting device.

Element	Claim Language
17	The dual fuel generator and fuel delivery system of claim 16, wherein the pressurized fuel source comprises a pressurized fuel container having a collar; and wherein the regulator mounting device fixes to the collar so that the primary and secondary pressure regulators are positioned adjacent each other along an outer periphery of the collar.
18	The dual fuel generator and fuel delivery system of claim 12 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.
19	The dual fuel generator and fuel delivery system of claim 18 wherein the dual stage regulator is mounted directly onto the pressurized fuel source.
[20.0]	A dual fuel generator and fuel delivery system comprising:
[20.1]	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, the dual fuel generator comprising:
[20.2]	a gaseous fuel valve coupled to an inlet of the gaseous fuel line and connectable to the pressurized fuel source, and
[20.3]	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

Element	Claim Language
[20.4]	a fuel regulator system located off board the dual fuel generator, the fuel regulator system comprising:
[20.5]	a primary pressure regulator connectable 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
[20.6]	a secondary pressure regulator coupled to the primary pressure regulator and connectable to the gaseous fuel valve, the secondary pressure regulator 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.
21	The dual fuel generator and fuel delivery system of claim 20 wherein the pressurized fuel source is independent and disconnected from the dual fuel generator.
22	The dual fuel generator and fuel delivery system of claim 21 wherein the fuel regulator system is disconnected from the dual fuel generator.
23	The dual fuel generator and fuel delivery system of claim 21 wherein the primary pressure regulator is disconnected from the pressurized fuel source.
24	The dual fuel generator and fuel delivery system of claim 20 wherein the gaseous fuel valve comprises at least one end of a quick-connect hose coupling mounted to an external surface of the dual fuel generator.
[25.1]	The dual fuel generator and fuel delivery system of claim 20 further comprising a fuel lockout apparatus coupled to the mechanical fuel valve; and

Element	Claim Language
[25.2]	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.
[26.1]	The dual fuel generator and fuel delivery system of claim 20, wherein the 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:
[26.2]	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.
27	The dual fuel generator and fuel delivery system of claim 26, 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.
28	The dual fuel generator and fuel delivery system of claim 26, 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.

Element	Claim Language
29	The dual fuel generator and fuel delivery system of claim 20, wherein the gaseous fuel valve comprises: 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.
30	The dual fuel generator and fuel delivery system of claim 20, further comprising a regulator mounting device fixed to the pressurized fuel source with at least the secondary pressure regulator mounted on the regulator mounting device.
31	The dual fuel generator and fuel delivery system of claim 30, wherein the primary pressure regulator is mounted on the regulator mounting device.
32	The dual fuel generator and fuel delivery system of claim 31, wherein the pressurized fuel source comprises a pressurized fuel container having a collar; and wherein the regulator mounting device fixes to the collar so that the primary and secondary pressure regulators are positioned adjacent each other along an outer periphery of the collar.
33	The dual fuel generator and fuel delivery system of claim 20, wherein the primary and secondary pressure regulators are integral components of a dual stage pressure regulator.
[34.0]	A dual fuel generator and fuel delivery system comprising:

Element	Claim Language
[34.1]	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;
[34.2]	a fuel regulator system located off board the dual fuel generator, the fuel regulator system comprising:
[34.3]	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
[34.4]	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
[34.5]	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;
[34.6]	wherein the mechanical fuel valve outputs gaseous fuel to the dual fuel generator during operation thereof on gaseous fuel at the desired pressure from the secondary pressure regulator.
[35.1]	The dual fuel generator and fuel delivery system of claim 34 further comprising a fuel lockout apparatus coupled to the mechanical fuel valve; and

Element	Claim Language
[35.2]	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.
[36.1]	The dual fuel generator and fuel delivery system of claim 34, wherein the 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:
[36.2]	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.
37	The dual fuel generator and fuel delivery system of claim 36, 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.
38	The dual fuel generator and fuel delivery system of claim 36, 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.

Element	Claim Language
39	The dual fuel generator and fuel delivery system of claim 34, 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.
40	The dual fuel generator and fuel delivery system of claim 34, further comprising a regulator mounting device fixed to the pressurized fuel source with at least the secondary pressure regulator mounted on the regulator mounting device.
41	The dual fuel generator and fuel delivery system of claim 40, wherein the primary pressure regulator is mounted on the regulator mounting device.
42	The dual fuel generator and fuel delivery system of claim 41, wherein the pressurized fuel source comprises a pressurized fuel container having a collar; and wherein the regulator mounting device fixes to the collar so that the primary and secondary pressure regulators are positioned adjacent each other along an outer periphery of the collar.
43	The dual fuel generator and fuel delivery system of claim 34, wherein the primary and secondary pressure regulators are integral components of a dual stage pressure regulator.
[44.0]	A dual fuel generator comprising:
[44.1]	an alternator;

Element	Claim Language
[44.2]	a dual fuel engine coupled to drive the alternator, the dual fuel engine configured to operate on a liquid fuel supplied from a liquid fuel source and a gaseous fuel supplied from a pressurized fuel source;
[44.3]	a liquid fuel line coupled to the dual fuel engine to provide the liquid fuel from the liquid fuel source;
[44.4]	a gaseous fuel line coupled to the dual fuel engine to provide the gaseous fuel from the pressurized fuel source; and
[44.5]	a mechanical fuel valve actuatable between a first position and a second position to selectively control fuel flow to the dual fuel engine from the liquid fuel source through the liquid fuel line and the pressurized fuel source through the gaseous fuel line;
[44.6]	wherein the dual fuel generator is free from any gaseous fuel pressure regulator.
45	The dual fuel generator of claim 44 further comprising a gaseous fuel valve coupled to an inlet of the gaseous fuel line to connect the pressurized fuel source thereto.
46	The dual fuel generator of claim 45 further comprising a generator housing surrounding at least the dual fuel engine and the alternator with the gaseous fuel valve mounted on or within the generator housing.
47	The dual fuel generator of claim 44 wherein the mechanical fuel valve is located upstream from the liquid fuel line and the gaseous fuel line to selectively control fuel flow into the liquid fuel line from the liquid fuel source and the gaseous fuel line from the pressurized fuel source.

Element	Claim Language
48	The dual fuel generator of claim 44 wherein the mechanical fuel valve comprises a liquid fuel valve coupled to the liquid fuel line and a gaseous fuel valve coupled to the gaseous fuel line.
49	The dual fuel generator of claim 44 further comprising: a first end of a quick-connect hose coupling coupled to an outlet of the pressurized fuel source; 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 pressurized fuel source to the gaseous fuel line.
[50.1]	The dual fuel generator of claim 44, wherein the mechanical fuel valve opens and closes the liquid fuel line to selectively control fuel flow from the liquid fuel source to the dual fuel engine; and further comprises:
[50.2]	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.
51	The dual fuel generator of claim 50, 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.
52	The dual fuel generator of claim 50, 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.

Harbor Freight Tools USA, Inc. (“Harbor Freight”), Generac Power Systems, Inc., and MWE Investments, LLC, (“Petitioners”) petition for *Inter Partes* Review (“IPR”) under 35 U.S.C. §§311-319 and 37 C.F.R. §42 of Claims 1-52 (“the Challenged Claims”) of U.S. Patent No. 11,840,970 (“the ’970 Patent”). This Petition establishes a reasonable likelihood that Petitioners will prevail in showing at least one of the Challenged Claims is unpatentable. Petitioners respectfully request that this IPR be instituted, and that the Challenged Claims be canceled as unpatentable.

I. STANDING AND RELIEF REQUESTED

Petitioners certify that the ’970 Patent is available for IPR. Petitioners are not barred or estopped from requesting this review, and request IPR of the Challenged Claims on the grounds set forth below.

Ground	Claim(s) Challenged	35 U.S.C. §	Reference(s)
1	1-5, 34-37	103	Chaudhari in view of Hallberg
2	12-14, 44, 48, 50-51	103	Chaudhari in view of Hallberg and Jungmann
3	8-11, 16-19, 40-43	103	Chaudhari in view of Hallberg, Jungmann, and Parlatore
4	7, 15, 20-27, 29-33, 39, 45-46, 49	103	Chaudhari in view of Hallberg, Jungmann, Parlatore, LP-Gas Handbook, Sturgis, and Tri-Fuel Video

Ground	Claim(s) Challenged	35 U.S.C. §	Reference(s)
5	1-6, 8-14, 16-19, 34-38, 40-44, 47-48, 50-52	103	DuroMax in view of Parlatore and Elsdon
6	7, 15, 20-33, 39, 45-46, 49	103	DuroMax in view of Parlatore, LP-Gas Handbook, Sturgis, Elsdon, and Tri-Fuel Video
7	1-2, 12-14, 20-21, 34, 44-45, 48	103	Chaudhari in view of Monros and Jungmann

This Petition explains how the claims are unpatentable under the statutory grounds identified, identifying where each element can be found in the cited prior art and how the prior art renders the Challenged Claims unpatentable. The Petition is further supported by the declaration of Dr. Timothy Morse, an expert in the field of dual-fuel engines and fuel delivery systems. EX1003, ¶¶1-35.

II. STATE OF THE ART

A. Multi-Fuel Generators

The '970 Patent teaches that multi-fuel generators were known in the art at the time of the invention. EX1001, 1:42-47.

Multi-fuel generators have been known since at least 1999. *See generally* EX1008 (Chaudhari gasoline/kerosene generator configured to also operate on LPG).

This DuroMax dual-fuel generator was on sale since at least 2012:



EX1004, 1; EX1012, ¶¶3-4, 17-20.

B. Dual-Stage Regulators

A pressure regulator is designed to control vapor pressure. EX1017, 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.”); EX1003, ¶38. The same is true for outdoor appliances, such as portable generators and BBQ grills. EX1003, ¶38. 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. *Id.*

The LP-Gas Code has definitions for various types of regulators, including first-stage regulators, second-stage regulators, two-stage regulator systems, and integral two-stage regulators:

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.

EX1017, 40-41 (§3.3.64) (annotated).

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.

EX1017, 118-119 (commentary regarding §5.8.1).

Dual-stage regulators were well-known at the time of the invention.

EX1003, ¶42. For example, off-the-self dual-stage regulators were generally available at least by 2008:



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

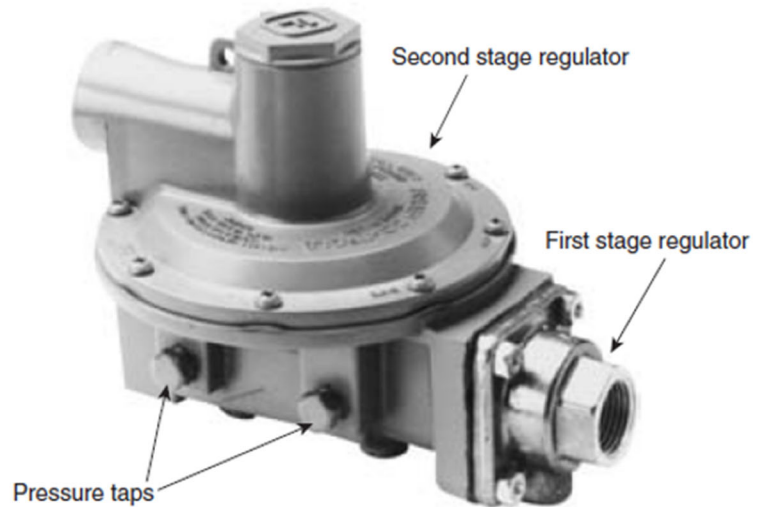


EXHIBIT 5.47 *Integral Two-Stage Regulator. (Courtesy of Fisher Controls Intl, LLC)*

EX1017, 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](#)

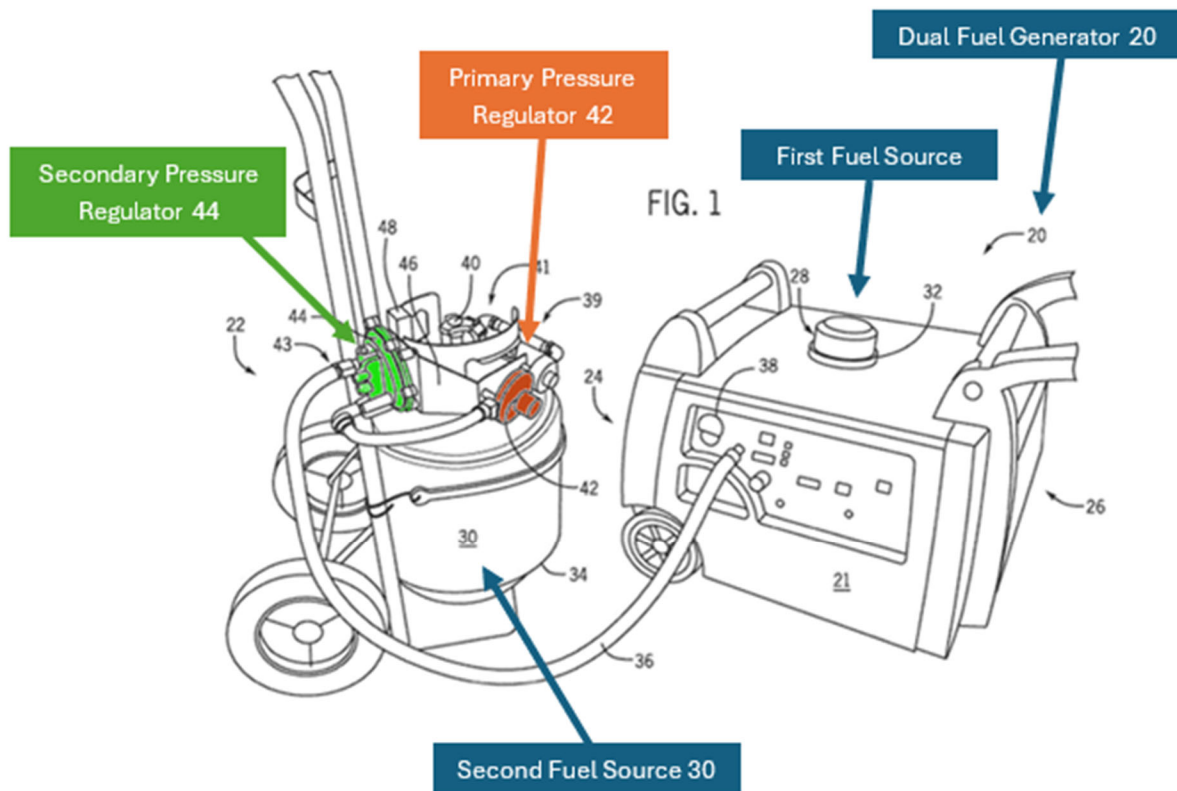
[Add to Wishlist](#) | [Add to Compare](#)

EX1016 (webpage from 2013).

III. SUMMARY OF THE '970 PATENT

A. The '970 Patent

The '970 Patent is directed to supplying liquid fuel and gaseous fuel to generators. EX1001, Abstract, 1:24-57. The '970 Patent acknowledges that multi-fuel generators typically run on liquid fuel (such as gasoline) and an alternative gaseous fuel (such as propane). EX1001, 1:24-41. Figure 1 of the '970 Patent discloses a perspective view of a generator with such an engine:



The '970 Patent teaches using two pressure regulators in the gaseous fuel line—a primary regulator coupled to the gaseous fuel source, and a downstream

U.S. Patent No. 11,840,970

regulator to further regulate the pressure of the gaseous fuel as it enters the engine. EX1001, 5:10-28. The '970 Patent states that the second regulator may be located on the generator or “off-board the generator to reduce size and cost of the generator.” EX1001, 5:29-38.

B. Prosecution History

The '970 Patent is part of a family that includes at least 13 U.S. patents and/or pending applications.¹ The '970 Patent issued from U.S. Application No. 17/937,046, which was filed on September 30, 2022, and claims priority to prior applications; the earliest is U.S. Application No. 14/738,060, filed on June 12, 2015.

The Examiner relied on U.S. Patent Pub. No. 2011/0168133 (“Pursifull”), U.S. Patent Pub. No. 2007/0137591 (“Sugimoto”), and two websites to reject the claims: GasHoseandRegulators, <https://web.archive.org/web/20140517093401/https://gashosesandregulators.com/>; and Nooutage.com,

¹ Family members include U.S. Patent App. Nos. 15/285,215; 14/738,060; 14/925,441; 15/332,264; 16/783,455; 16/946,438; 15/285,215; 16/191,503; 16/358,822; 16/946,439; 18/183,734; 18/443,487; and 19/026,996.

<http://web.archive.org/web/20061113112733/http://www.nooutage.com/40248.htm>.

EX1002, 70-75.

Patent Owner overcame the rejection by arguing lack of a motivation to combine Pursifull (a multi-fuel internal combustion engine) and Sugimoto (a generator that operates on gaseous fuel) because they disclose different types of engines (fuel injection and carburetor, respectively) and different fuel types (liquid fuel and gaseous fuel, respectively). EX1002, 82-89, 109-111, 145.

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 IPR, a POSA would have a degree in mechanical engineering, physics, materials science, or related fields, and three years of work experience in combustion engines. EX1003, ¶34. Additional higher graduate

education could substitute for work experience, and additional work experience/training could substitute for formal education. *Id.*

V. CLAIM CONSTRUCTION

The Board construes claims under the standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). 37 C.F.R. §42.100(b). Under this standard, claim terms should be given their plain and ordinary meaning as understood by a person of ordinary skill in the art and the prosecution history.

Petitioners propose the following claim constructions for certain claim terms. Petitioner has not identified any other claim terms that need construction in order to address the issues raised by this petition, but Petitioner reserves the right to respond to any constructions offered by Patent Owner or the Board.

A. The “Fuel Lockout Apparatus”

Several claims of the '970 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 EX1001, 6:30-7:24; 7:35-8:10; 8:47-60; 9:42-59.²

² If this term is not treated as a means-plus-function limitation, it should be given the meaning that patentee chose for it, as clearly supported by the sole embodiment

1. “Fuel Lockout Apparatus” Invokes §112(f)

The term “fuel lockout apparatus” does not provide any structure corresponding to the function of providing fuel lockout, thus invoking 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). A “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 using the word “means” because they “typically do not connote sufficiently definite structure” and therefore invoke §112(f). *Williamson*, 792 F.3d at 1350. “Apparatus” is another example of a generic term that often invokes §112(f). M.P.E.P. §2181 (“apparatus” is a “non-structural generic placeholders that may invoke 35 U.S.C. 112(f)”).

in the specification and discussed below—“a moveable barrier capable of blocking physical access for attaching a fuel source to a fuel inlet on the second fuel line.”

The phrase “fuel lockout apparatus” is not understood by POSAs to connote a specific structure. EX1003, ¶54. The claim merely replaces the term “means” with “apparatus.” *Id.* The term “fuel lockout apparatus” has no independent meaning aside from “a means for providing fuel lockout.” *Id.* 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 '970 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].” EX1001, 7:12-24. The flange “extends radially outward from fuel valve handle 56” and “sweeps over” the LPG fuel hose coupling “as the fuel valve handle rotates.” EX1001, 7:12-24. 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. EX1001, 7:22-25.

When the fuel lockout apparatus is in the first position (selecting gasoline), the flange provides a barrier that extends over the LPG supply hose coupling 50a, preventing the user from coupling a LPG supply hose (locking out LPG):

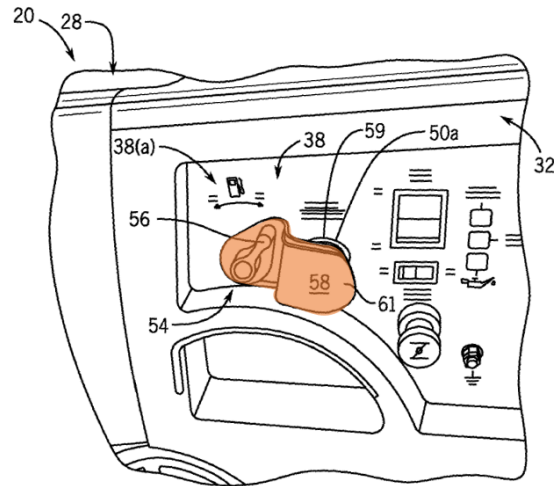


FIG. 2

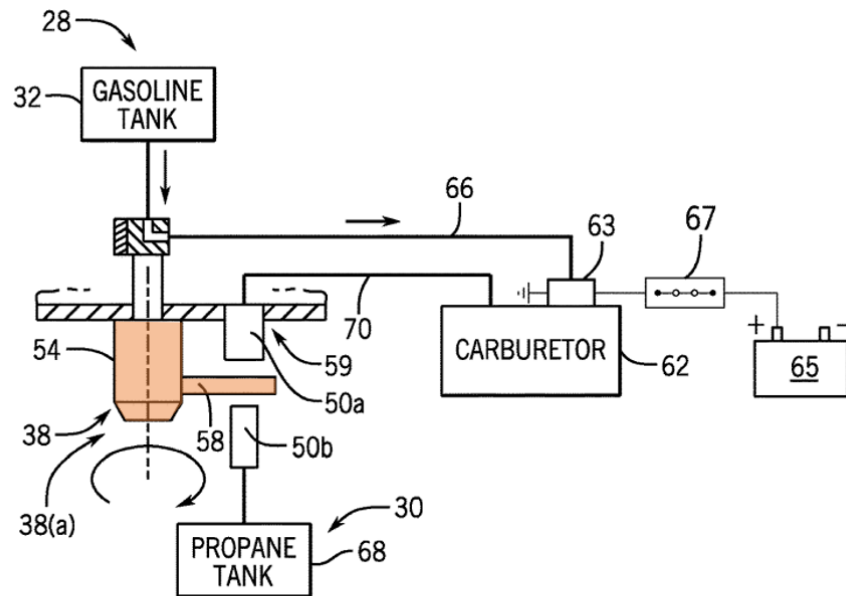
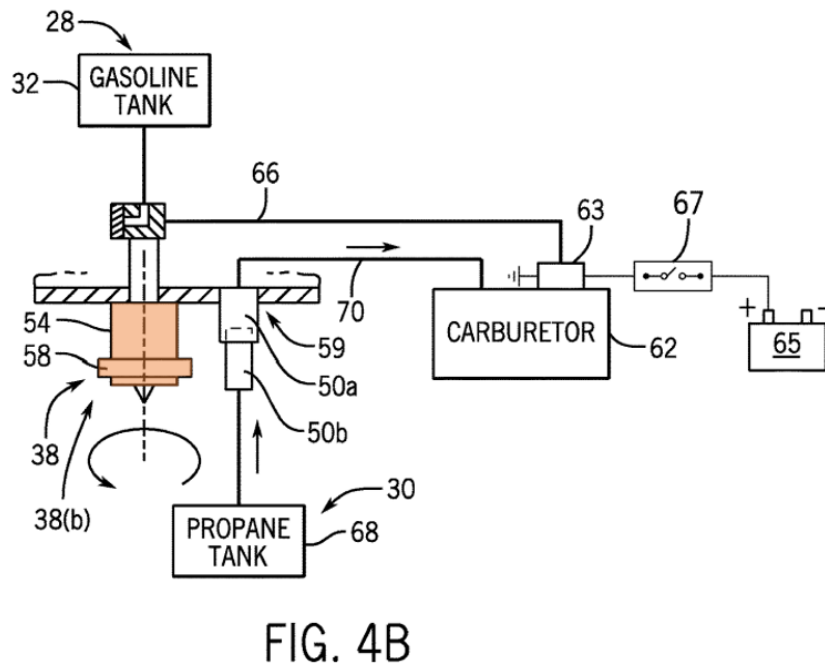
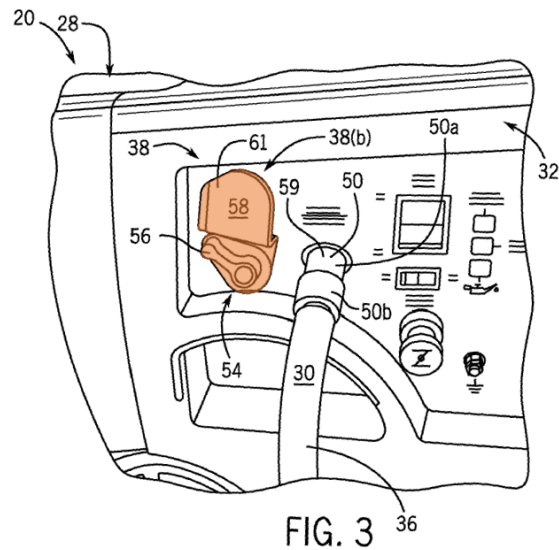


FIG. 4A

EX1001, Figs. 2, 4A,³ 7:64-8:11.

³ The color in '970 Patent and prior art figures are annotations unless indicated otherwise.

When in the second position (selecting LPG), the fuel lockout apparatus prevents the user from selecting gasoline until the LPG supply hose is removed (locking out gasoline):



EX1001, Figs. 3, 4B, 8:11-23.

The flange (61) provides both the gasoline and LPG lockout functionality. Thus, the proper structure corresponding to the “providing fuel lockout” functionality is items: 58 and 61 in Figures 2-3 and 4A-4B, as described in the specification at 5:50-6:10; 6:24-45; 6:56-7:31; 8:1-14; 8:63-9:11.

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

Claim 4 of the '970 Patent recites:

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

(Emphasis added); *see also* EX1001, claims 26, 35-36 & 50.

The terms “coupling” and “to couple” refer to physically connecting or attaching two items. EX1009, 4; EX1003, ¶60.

The '970 Patent specification discloses only one way the fuel lockout apparatus “prevent[s]...coupling”: the “flange” (61) “block[s] fuel inlet 59 to prevent coupling the first end 50a and second end 50b of the quick-disconnect hose coupling together.” EX1001, 8:53-60; *see also* EX1001, 6:45-7:11, Figs. 2, 4A.

The '970 Patent specification also discloses only one way the fuel lockout apparatus “permits” the pressurized fuel source “to couple” to the pressurized fuel

line: “fuel lockout apparatus 58 unblock[s] fuel inlet 59 to permit attaching first end 50a and second end 50b together.” EX1001, 8:53-60; Figs. 3, 4B; *see also* EX1001, 7:25-34, 9:31-41, Figs. 3, 4B.

Therefore, a POSA would have understood the terms “prevent...coupling” and “permit...to couple” to mean “prevent...attaching” and “permit...to attach,” respectively. EX1003, ¶63.

Indeed, the Examiner of related Patent No. 10,221,780 interpreted the term “coupling” to require not only fluid communication, but physical connection. EX1020, 79 (Examiner: “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)); EX1020, 79 (Champion prior art 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).

C. Patent Owner’s Proposed Constructions Are Incorrect

In the Related Matters (*infra* §VIII.B), 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.*, EX1011, 17, 19; *see also* EX1003, ¶¶64-65.

Patent Owner’s proposed constructions are wrong, as explained above. However, Petitioners include an alternative position in Grounds 1-2 and 4 for the claims reciting “fuel lockout apparatus,” showing how these claims are obvious under Patent Owner’s proposed constructions. In arguing in the alternative, Petitioners do not admit or concede that Patent Owner’s apparent constructions are correct.

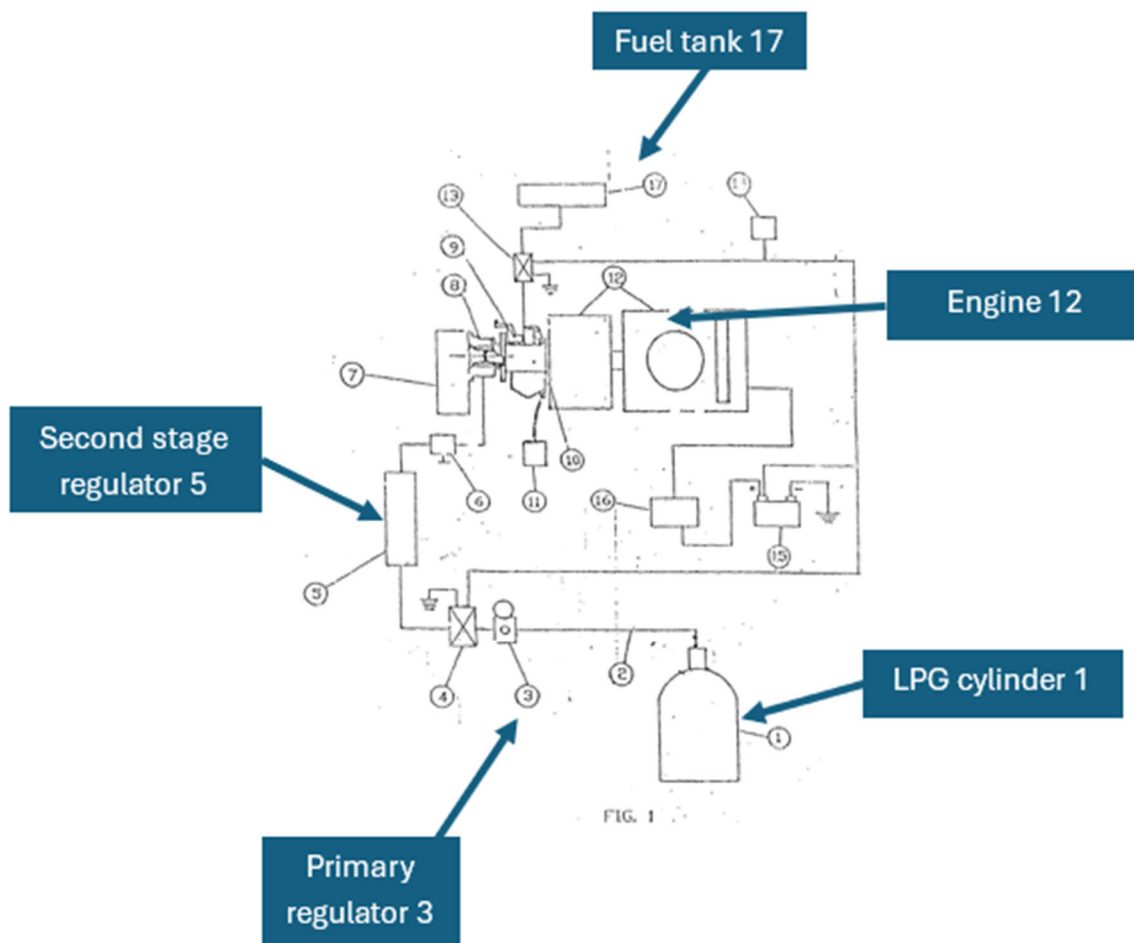
VI. OVERVIEW OF THE ASSERTED PRIOR ART

A. Indian Patent No. 207333 (“Chaudhari”)

Chaudhari was filed in 1999, published in 2006, and issued in 2007. EX1008, 2; EX1019. Chaudhari is prior art under §102(a).

Chaudhari discloses a system for supplying LPG to a generator that operates on gasoline or kerosene. EX1008, 4.

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. EX1008, 7.



EX1008, Fig. 1.

B. DuroMax XP4400EH Operator's Manual ("DuroMax")

DuroMax was published/publicly available at least by November 1, 2012.

EX1012, ¶¶18-19. DuroMax is prior art under §102(a).

DuroMax discloses the XP4400EH dual-fuel generator that runs alternatively on gasoline or LPG. EX1004, 2.

The generator includes a mechanical fuel shutoff valve having a valve handle:

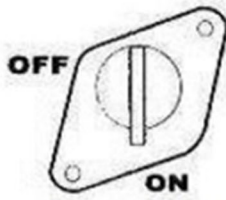


Figure 6 - fuel valve in the "on" position

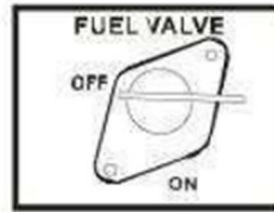


Figure A - Fuel Valve in the "OFF" position

EX1004, 11-12.

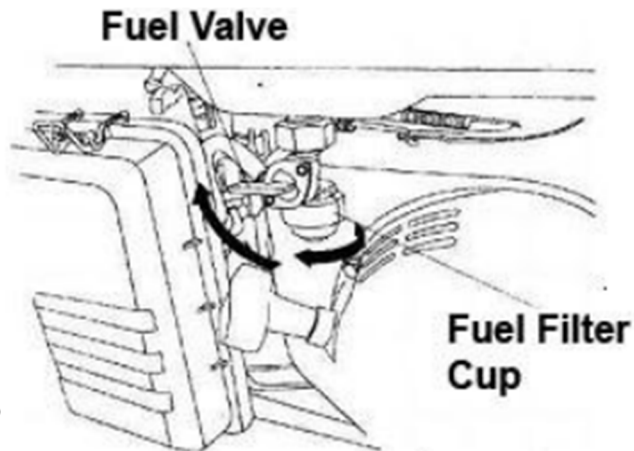
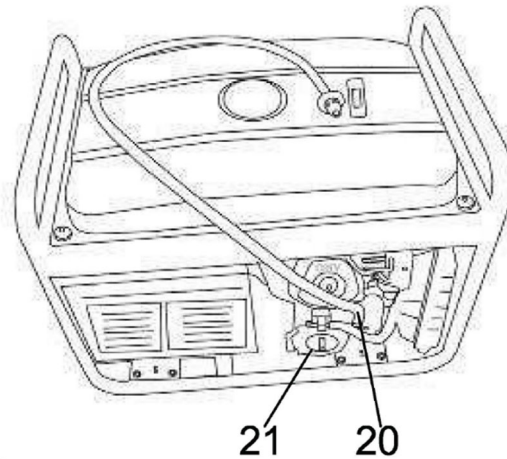


Figure 19 –Removing the Fuel Filter Cup

EX1004, 20.

The generator also includes a LPG fuel inlet.



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

EX1004, 7-8.

C. U.S. Patent Pub. No. 2011/0100335A1 (“Parlatore”)

Parlatore published in 2011. EX1010. Parlatore is prior art under §102(a).

Parlatore relates to a fuel delivery system that includes a propane (i.e., LPG) tank, a first regulator coupled to the tank, and a second regulator connected to the first regulator, as depicted in Figures 1 and 3:

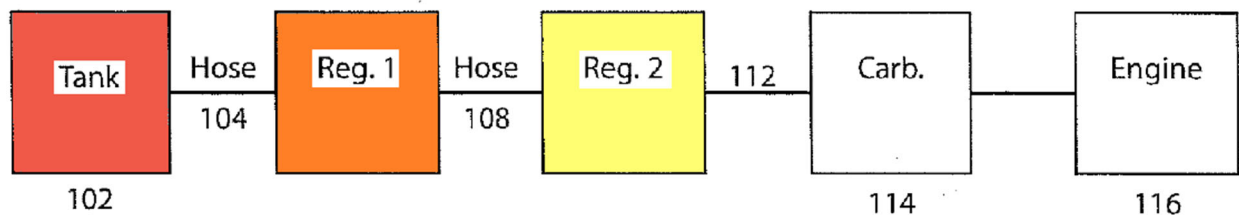
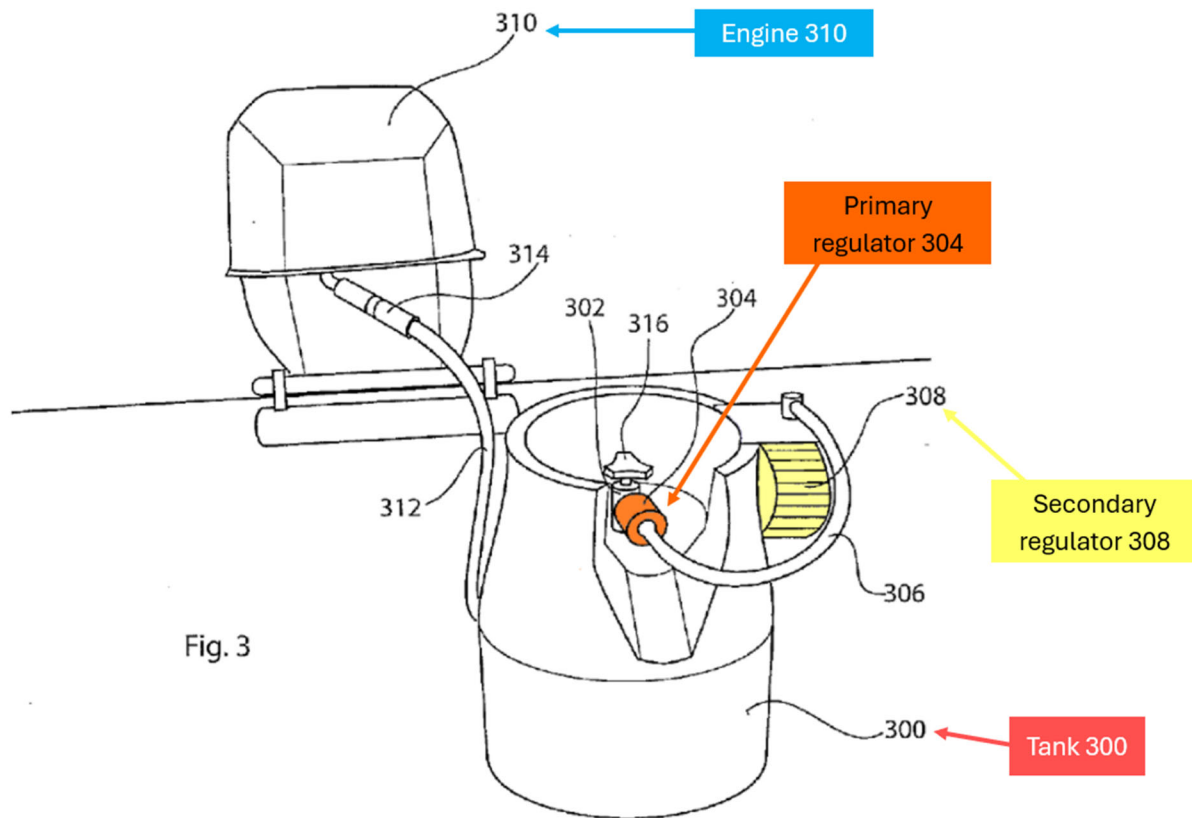


Fig. 1



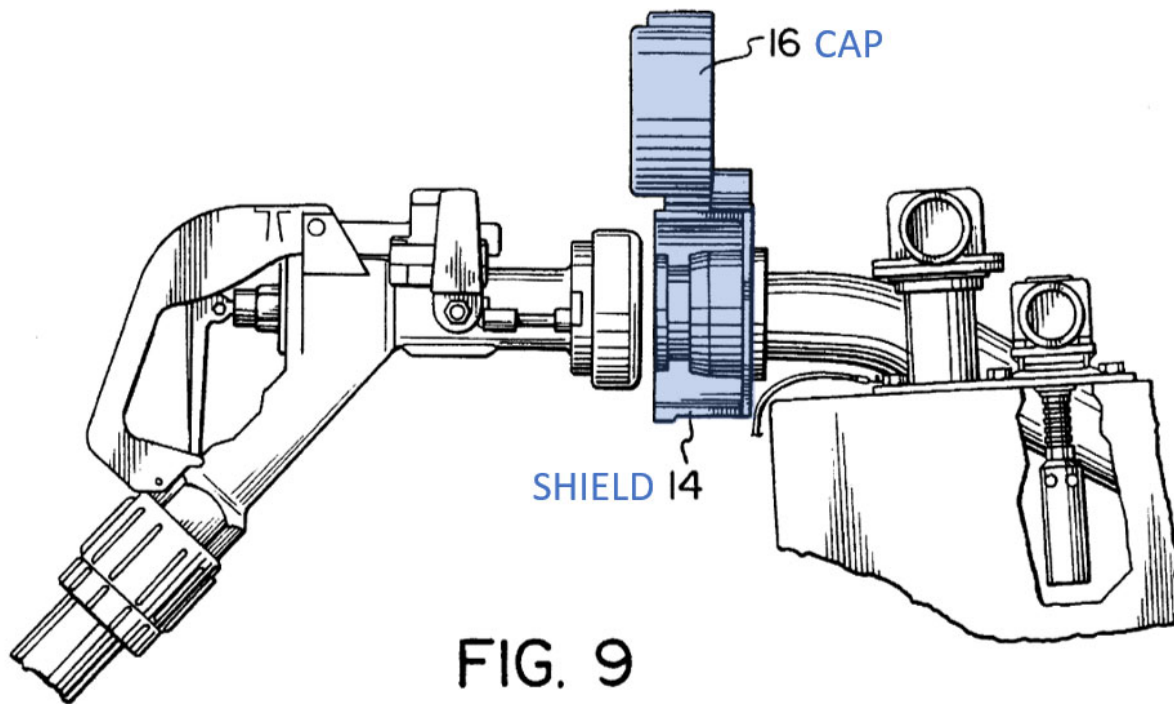
EX1010, ¶¶[0005]-[0006], Figs. 1, 3.

Parlatore thus discloses the use of primary and secondary pressure regulators, positioned at/near the LPG tank and remote from the engine/generator, to regulate propane delivery to an engine/generator.

D. U.S. Patent No. 5,718,265 (“Elsdon”)

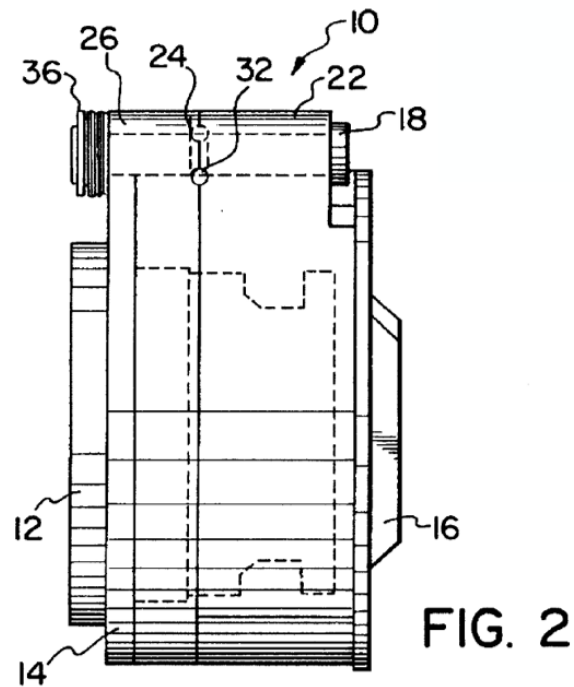
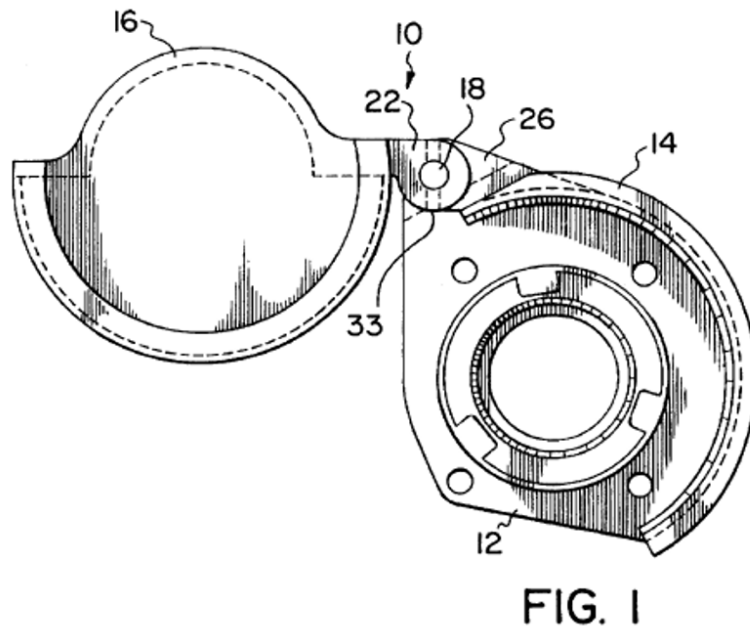
Elsdon issued in 1998. EX1005. Elsdon is prior art under §102(a).

Elsdon discloses a fluid conduit coupler 12 assembly having cap 16 and shield 14 that is used for “flammable or other hazardous fluids, such as fuel...” EX1005, 1:10-13, 3:3-4, Fig. 9.



EX1005, Fig. 9.

Cap 16 is connected to shield 14 and is moveable between an open position (Figures 1 and 9) and a closed position (Figure 2) in which cap 16 is positioned over coupler 12 to prevent coupling with a fuel hose. EX1005, 3:4-11.

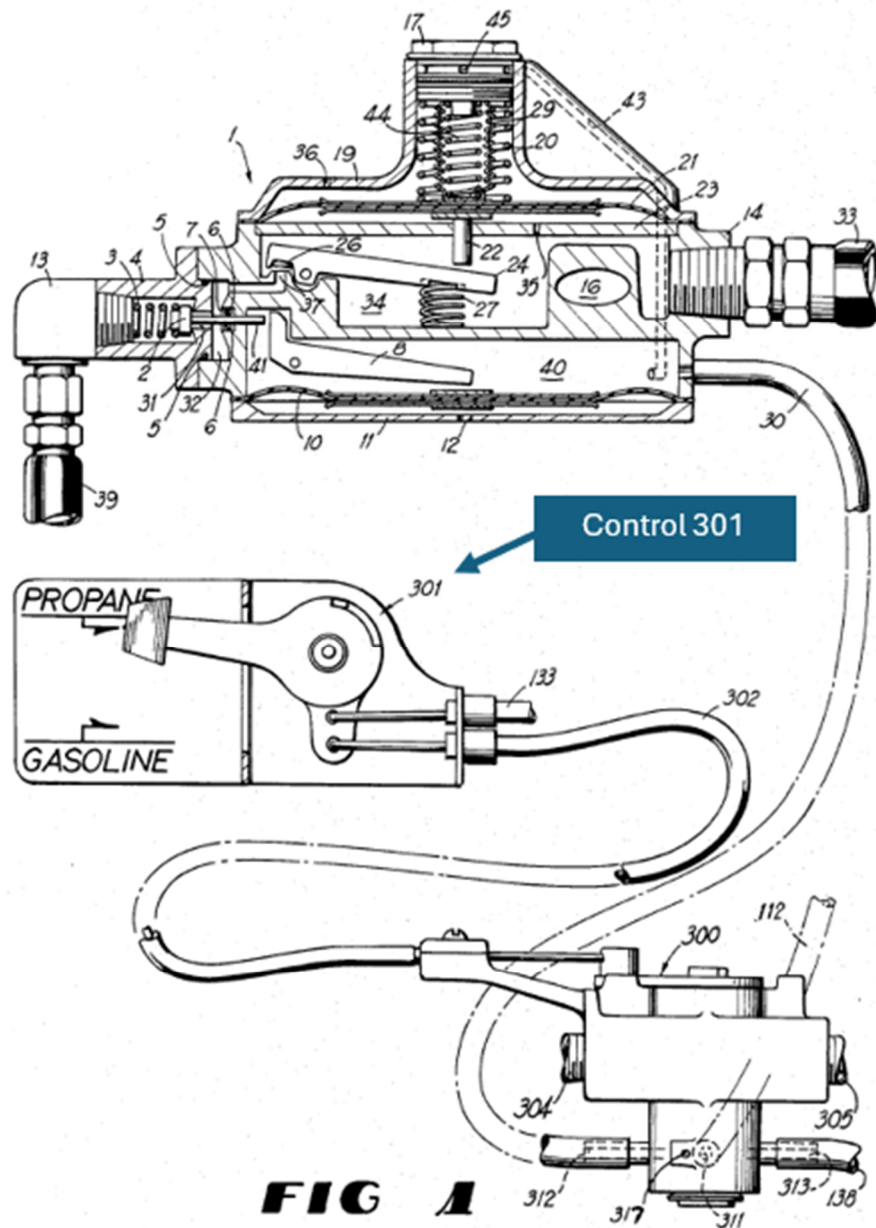


EX1005, Figs. 1-2.

E. U.S. Patent No. 4,492,207 (“Hallberg”)

Hallberg issued in 1985. EX1006. Hallberg is prior art under §102(a).

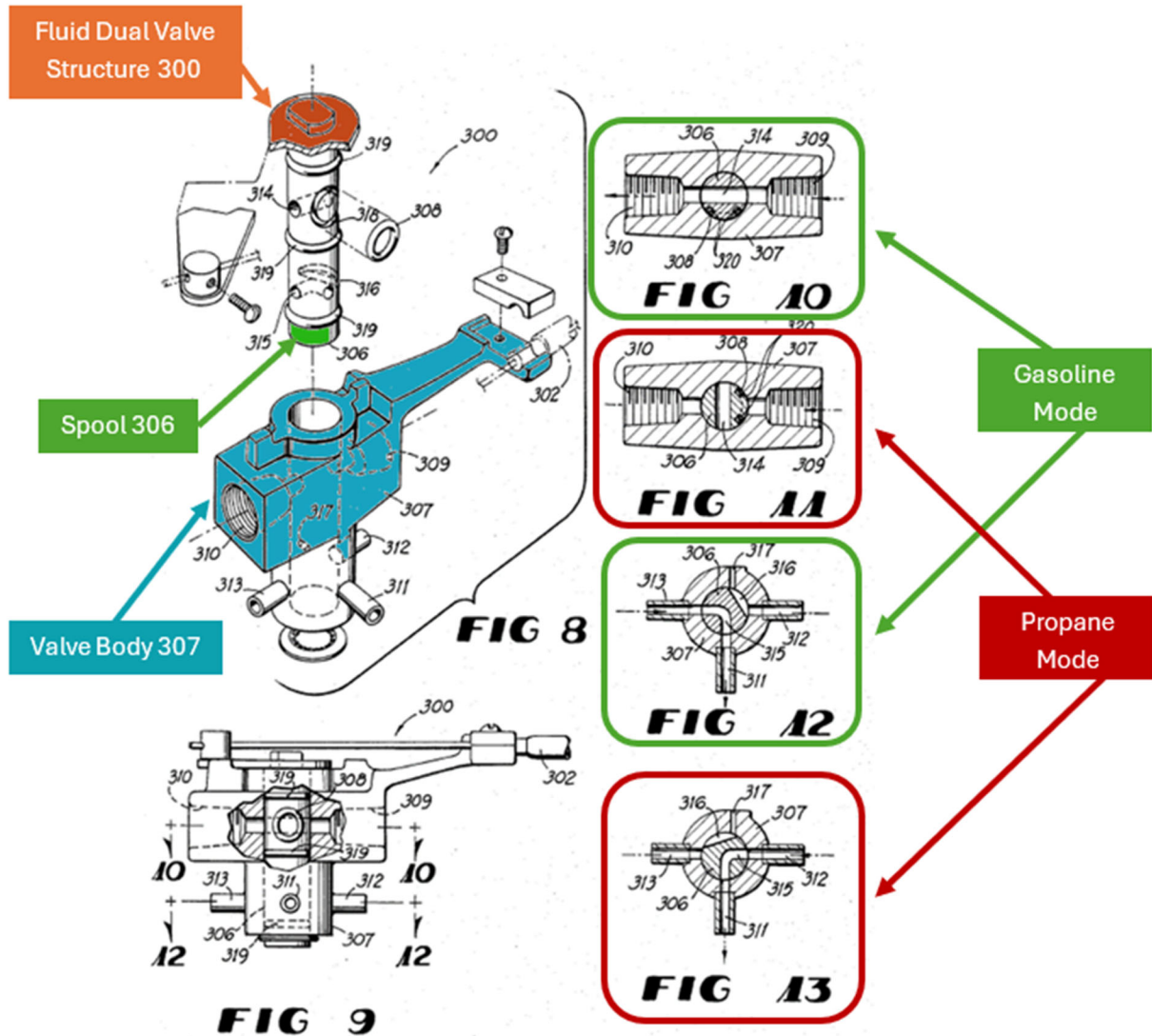
Hallberg discloses a dual-fuel system for use with internal combustion engines. EX1006, Abstract. The fuel type is selected by positioning control 301 in one of two positions, either “gasoline” or “propane.” EX1006, 7:27-29, Fig. 1.



EX1006, Fig. 1.

Positioning of control 301 in “gasoline” mode acts through control cable 302 to rotate spool 306 within valve body 307. EX1006, 7:30-38. Gasoline from gasoline supply line 304 is supplied to carburetor 110 through engine gasoline line 305, which lines communicate through tunnel 314 connecting liquid inlet opening 309 and liquid outlet opening 310 in fluid dual valve 300. EX1006, 7:38-44; Fig. 10.

When selecting “propane” mode for control 301, spool 306 rotates 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, thereby prohibiting flow of gasoline to carburetor 110. EX1006, 8:3-10; Fig. 11.



EX1006, 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. EX1006, 8:31-36. Atmospheric pressure on the opposite side of diaphragm 10 urges it 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. EX1006, 8:36-40. Upon opening valve 2, propane flows through inlet valve orifice 31 into liquified fuel passage 32 and onto the mixer 100. EX1006, 8:40-60. When valve 2 is closed, valve 2 and related structures provide a “lock-off” of propane. EX1006, 7:64-68.

F. U.S. Patent Pub. No. 2014/0239645 (“Jungmann”)

Jungmann was filed on February 28, 2013, and published on August 28, 2014. EX1021. Jungmann is prior art under §102(a).

Jungmann discloses a generator in a housing comprising an alternator driven by an internal combustion engine:

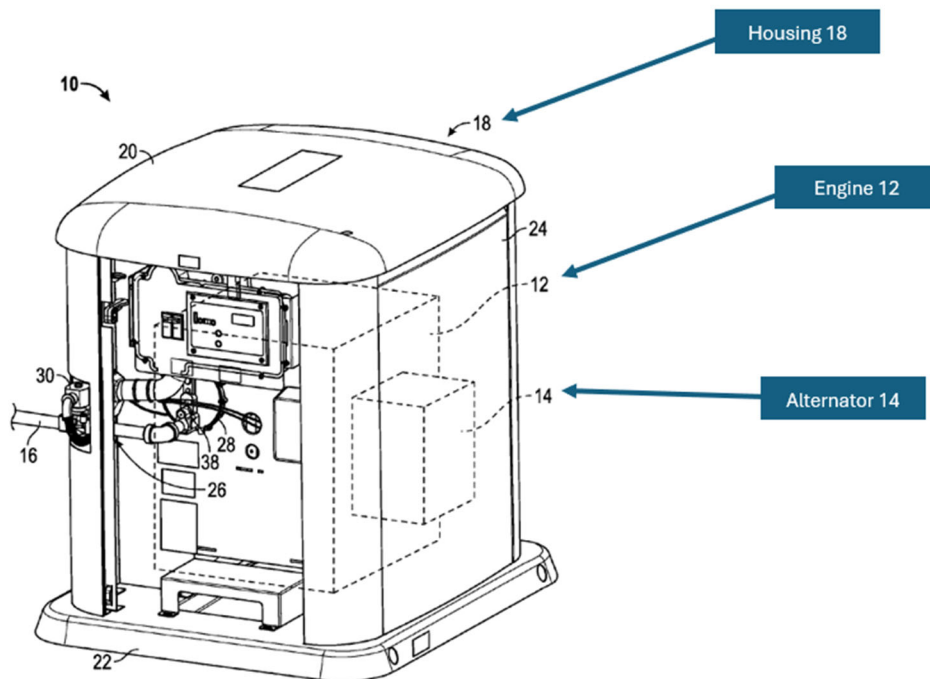


FIG. 1

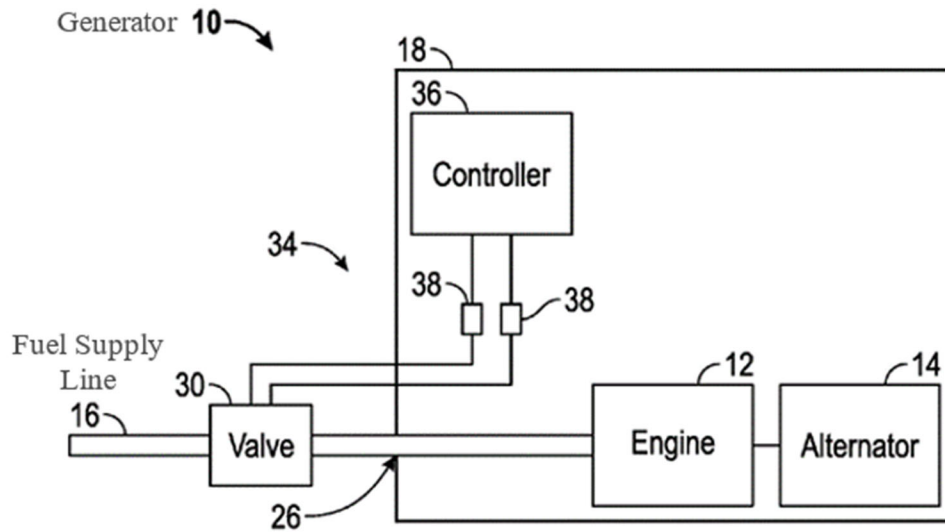


FIG. 3

Figs. 1 & 3, Abstract, ¶¶[0002], [0015].

G. LP-Gas Handbook

LP-Gas Handbook was published/publicly available in 2008. EX1017, 3; EX1003, ¶¶81-84. It is prior art under §102(a).

LP-Gas Handbook is the Eighth Edition in its series. EX1017, 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. EX1017, 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.

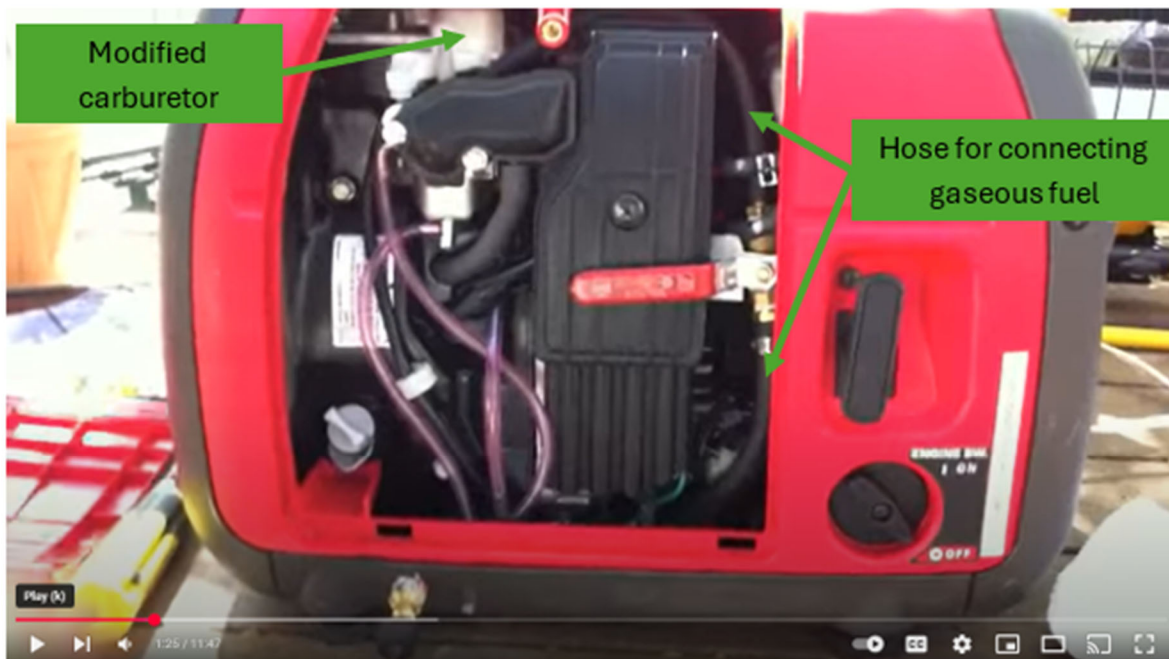
Quick connectors are used to connect transfer hose to piping and valves for loading and unloading cargo tank vehicles or railroad tank cars. They can also be used as connectors on swivel-type transfer piping. Quick connectors are also used in other LP-Gas systems, such as those used for engine fuel refueling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

EX1017, 40.

H. Tri-Fuel Video

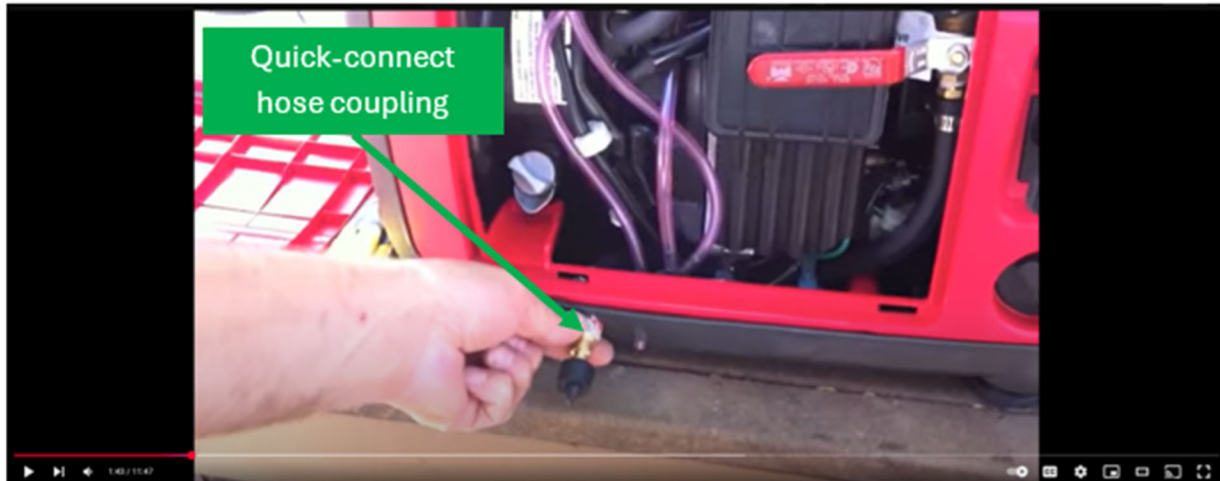
The Tri-Fuel Video (EX1007) is a YouTube video entitled “Honda Generator Tri-Fuel, EU2000i Triple-Fuel” posted by the profile “Mark ‘Mark1Jordon1’ Kash” on October 2, 2011, as well as viewed and commented on at least 13 years ago. EX1014-1015. It is prior art under §102(a).

The Tri-Fuel Video discloses a Honda gasoline generator modified to also operate on propane or natural gas using a quick-connect to connect the gas hose to the generator. EX1007, 0:36–2:00.⁴



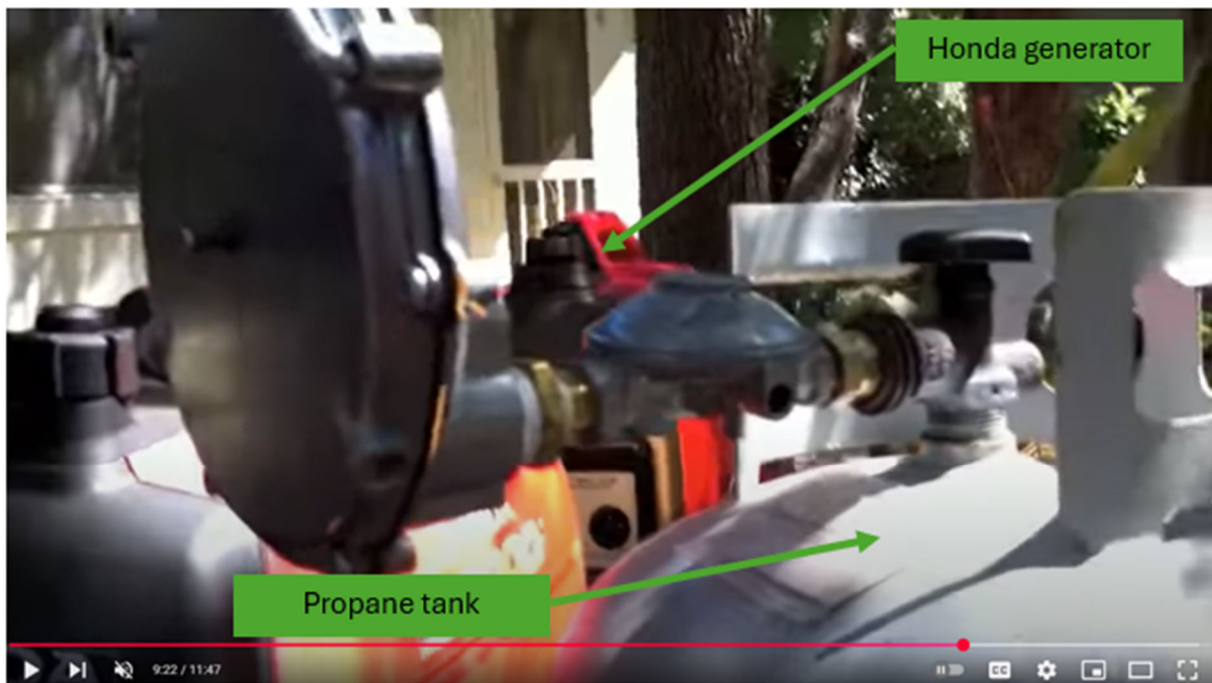
EX1007, 1:25.

⁴ Citations to the Tri-Fuel Video refer to the time stamp in the video.



EX1007, 1:46-1:50.

The propane tank and regulators are remote from the generator:



EX1007, 9:18.



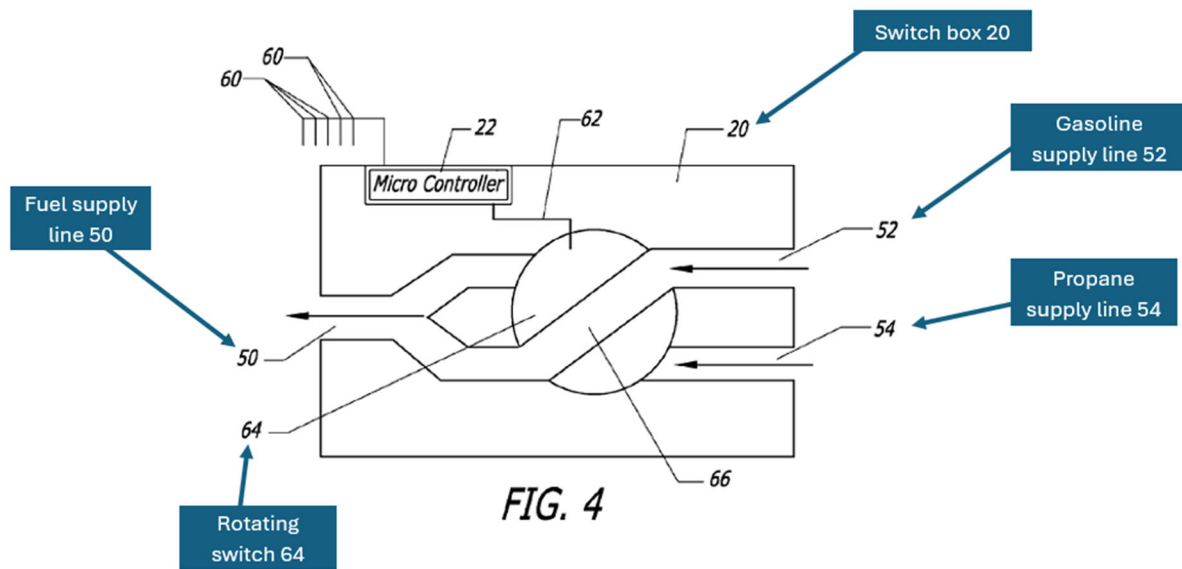
EX1007, 1:58.

I. U.S. Patent Pub. No. 2014/0202430 (“Monros”)

Monros was filed on January 15, 2014, and published on July 24, 2014.

EX1022. Monros is prior art under §102(a).

Monros discloses a switch box 20 for selecting the flow of gasoline or propane to an engine, actuatable between two positions by rotation. EX1022, ¶¶[0025], [0027].

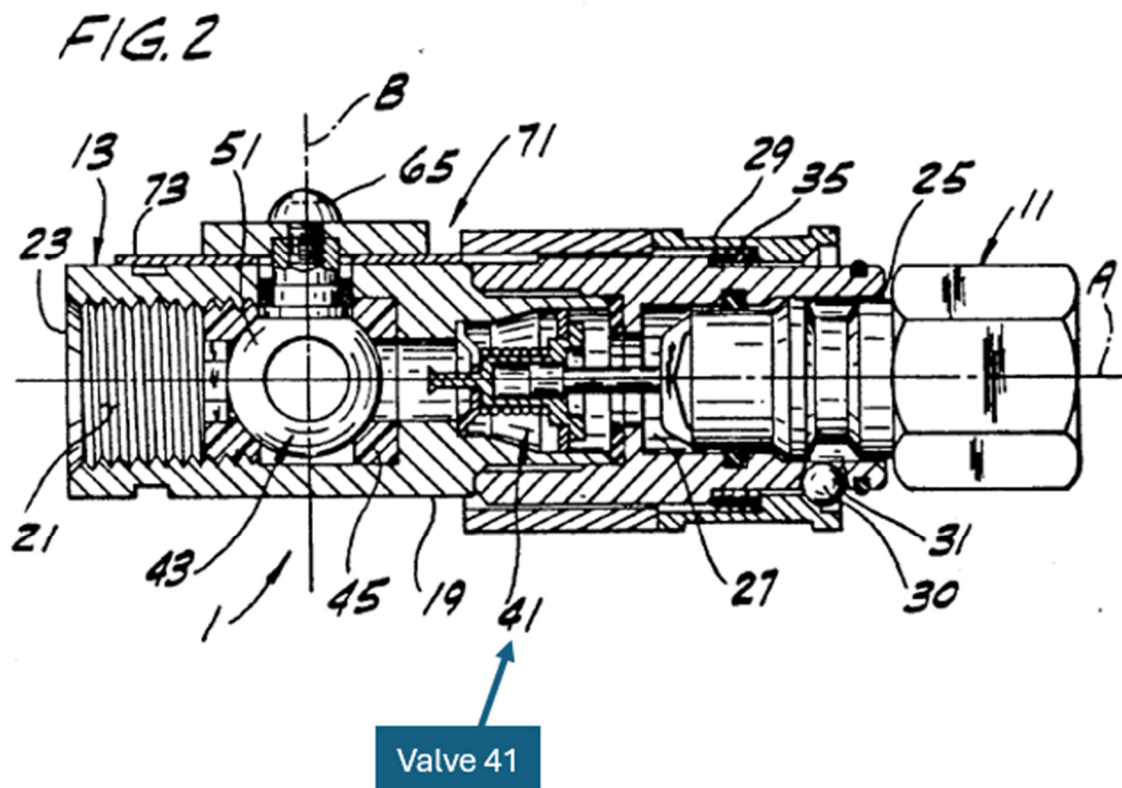


EX1022, Fig. 4.

J. U.S. Patent No. 5,172,723 (“Sturgis”)

Sturgis issued in 1992. EX1023. Sturgis is prior art under §102(a).

Sturgis discloses a quick-connect coupling for a gas supply line (e.g., natural gas or LPG) with an integral valve 41. EX1023, 1:6-10, 2:5-25, 4:6-13, 5:32-52, Figs. 2, 2A & 2B.



EX1023, Fig. 2.

VII. THE CHALLENGED CLAIMS ARE UNPATENTABLE

A. Ground 1: Claims 1-5 and 34-37 are obvious over Chaudhari in view of Hallberg

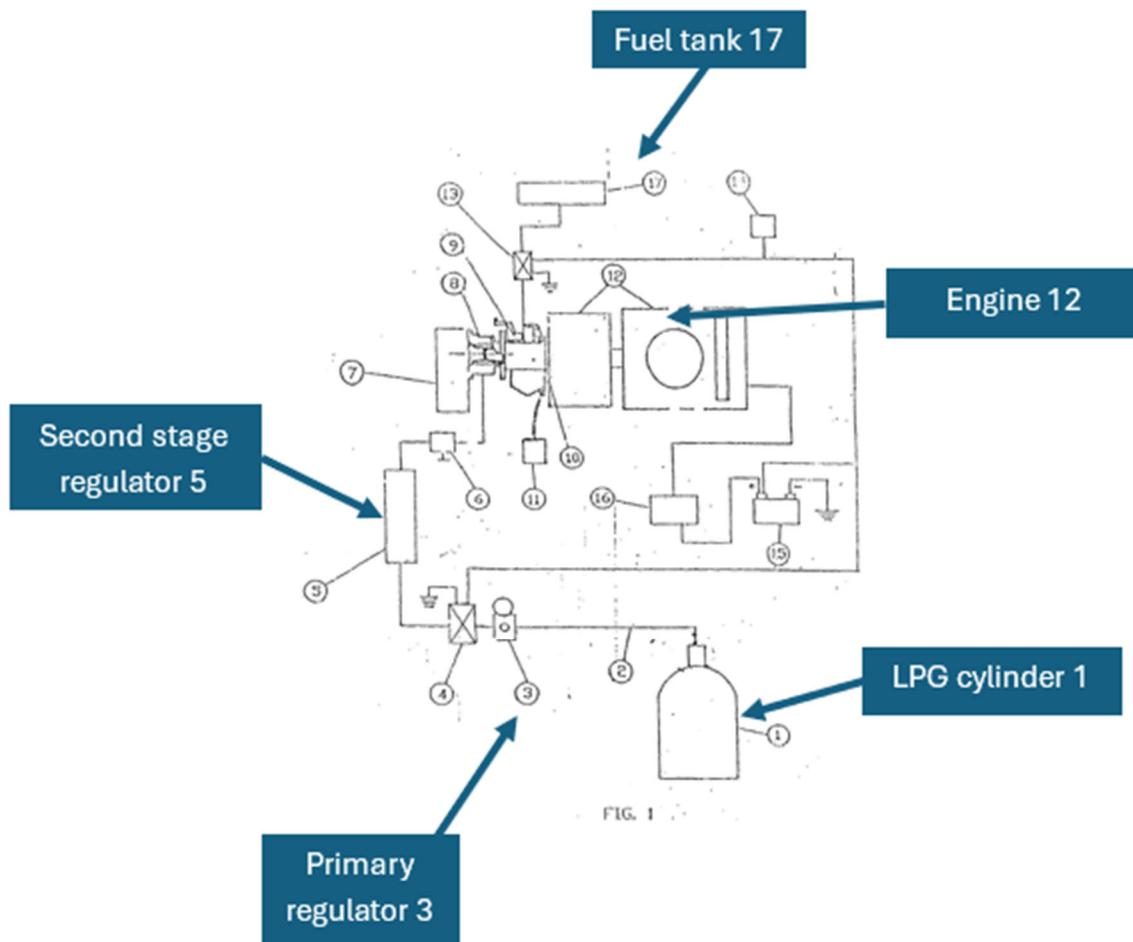
These claims are obvious under §103, as detailed below and in the declaration of Dr. Morse. EX1003, ¶¶95-177.

Of these claims, claims 3-5 and 35-37 are obvious under Patent Owner's proposed constructions.

1. Claim 1

a. Element [1.0]

Chaudhari discloses a dual-fuel generator configured to run alternatively on LPG and gasoline or kerosene and a system for delivering these fuels to the generator. EX1008, 5-9, Fig. 1; *infra* §VII.A.1.b.

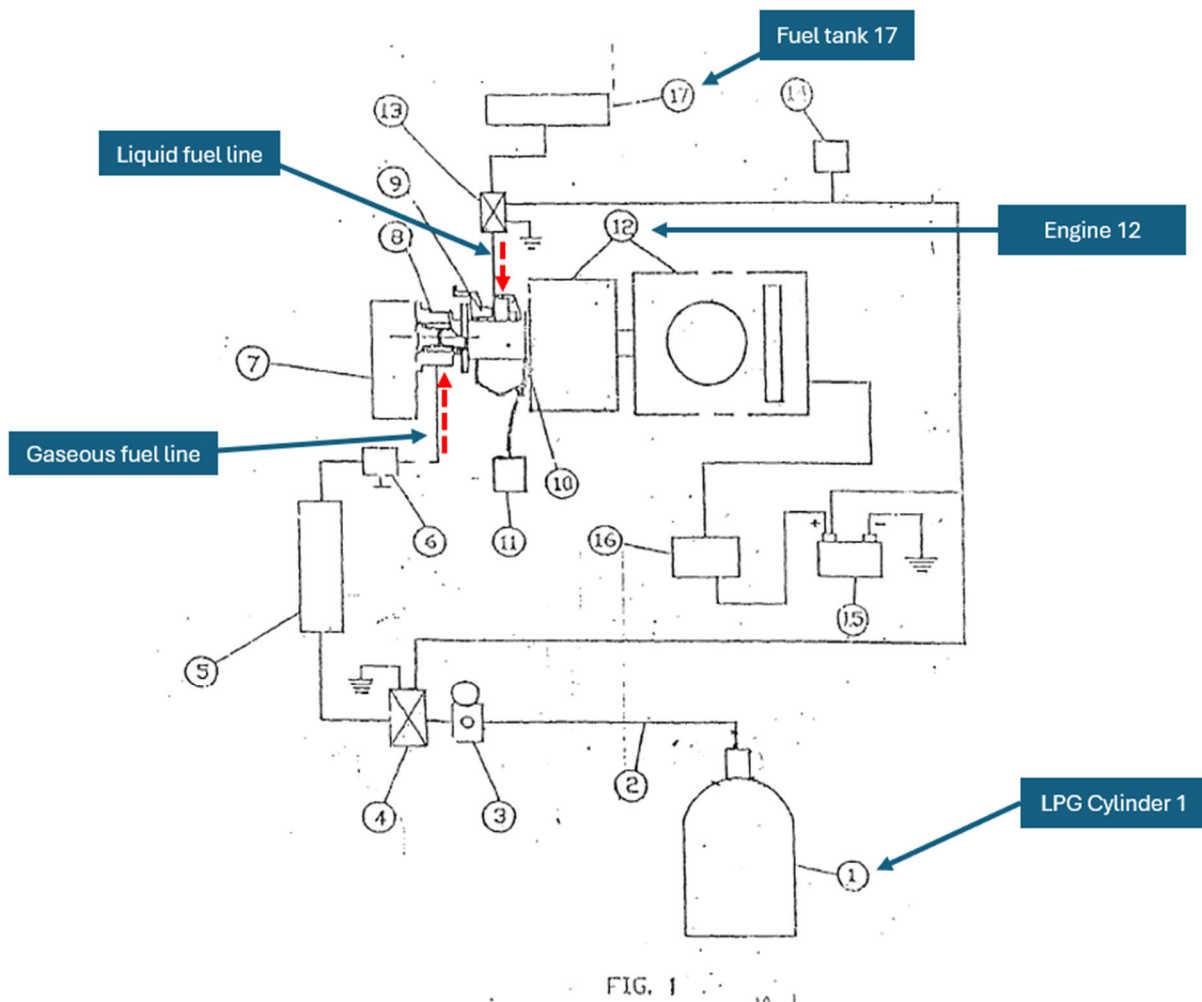


EX1008, Fig. 1.

b. Element [1.1]

Chaudhari discloses engine 12 is configured to operate on a gaseous fuel (LPG) supplied from a LPG cylinder. EX1008, 7. LPG is supplied through a gaseous fuel line, including high-pressure tube 2. EX1008, 7. The LPG cylinder is pressurized as noted by Chaudhari's claim 1 (cylinder stores LPG "under pressure") and because Chaudhari discloses pressure regulators to reduce the pressure of LPG from the cylinder via high-pressure tube 2. EX1008, 7, 11; EX1003, ¶101.

The generator also operates on liquid fuel (kerosene or gasoline), supplied from tank 17 through a liquid fuel line. EX1008, 7, Fig. 1.



EX1008, Fig. 1.

The '970 Patent confirms gasoline is liquid fuel and LPG/propane is a gaseous fuel. EX1001, 1:47-50, 4:45-46; EX1003, ¶102.

c. Element [1.2]

Chaudhari discloses carburetor 9 attached to the intake of engine 12; the carburetor connects the liquid fuel line to the intake:



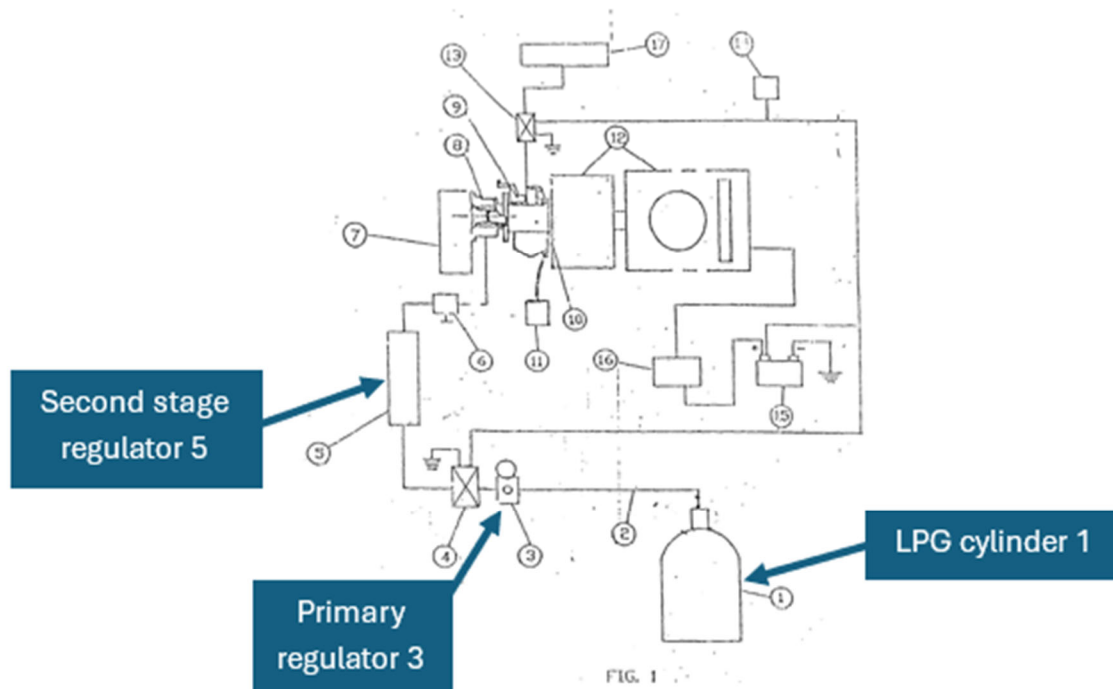
EX1008, Fig. 1, 8; EX1003, ¶104.

Chaudhari discloses gas-air mixer 8 “supplies air-fuel mixture through a carburetor (9).” *Id.*, 7.

A POSA would have understood Chaudhari's engine operated by mixing fuel (LPG or kerosene/gasoline) with air prior to combustion in the engine, as confirmed by Chaudhari's references to the gas-air mixer that supplies air-fuel mixture through the carburetor to the engine. EX1008, 7-8; EX1003, ¶107.

d. Element [1.3]

Chaudhari's fuel regulator system is off-board the generator. EX1008, 4-5 (the fuel delivery system is an improved "Add-On" system), Fig. 1; EX1003, ¶109. Chaudhari discloses primary regulator 3 and second stage regulator 5. EX1008, 7-8, Fig. 1.



EX1008, Fig. 1.

e. Element [1.4]

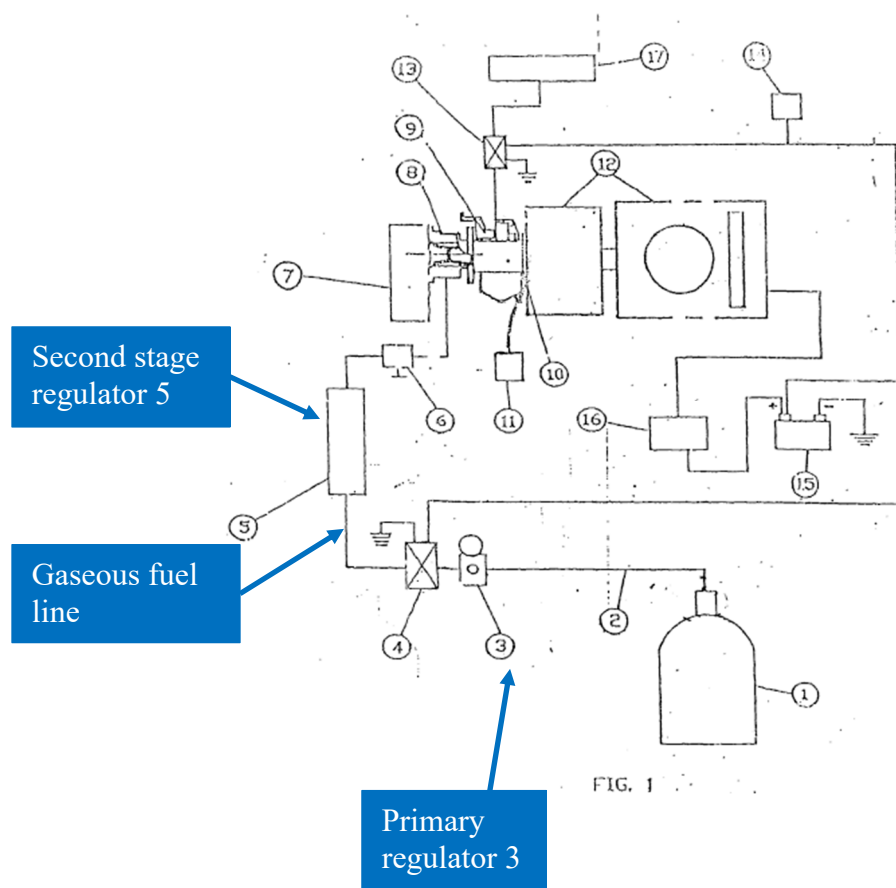
Chaudhari discloses primary regulator 3 that regulates LPG supplied from the LPG cylinder via high-pressure tube 2 to a reduced pressure in a first stage. EX1008, 7, Fig. 1; EX1003, ¶111. Chaudhari discloses primary regulator 3 is

coupled to a service valve, which is a needle valve mounted on LPG cylinder 1.

EX1008, 7; EX1003, ¶111.

f. Element [1.5]

Chaudhari discloses second stage regulator 5 that regulates LPG from primary regulator 3 down to a desired pressure in a second stage for supply through the gaseous fuel line (the line connecting the second stage regulator to the engine) to operate the generator. EX1008, 7, Fig. 1; EX1003, ¶113. Second stage regulator 5 is coupled to primary regulator 3 by way of the gaseous fuel line and LPG solenoid valve 4:



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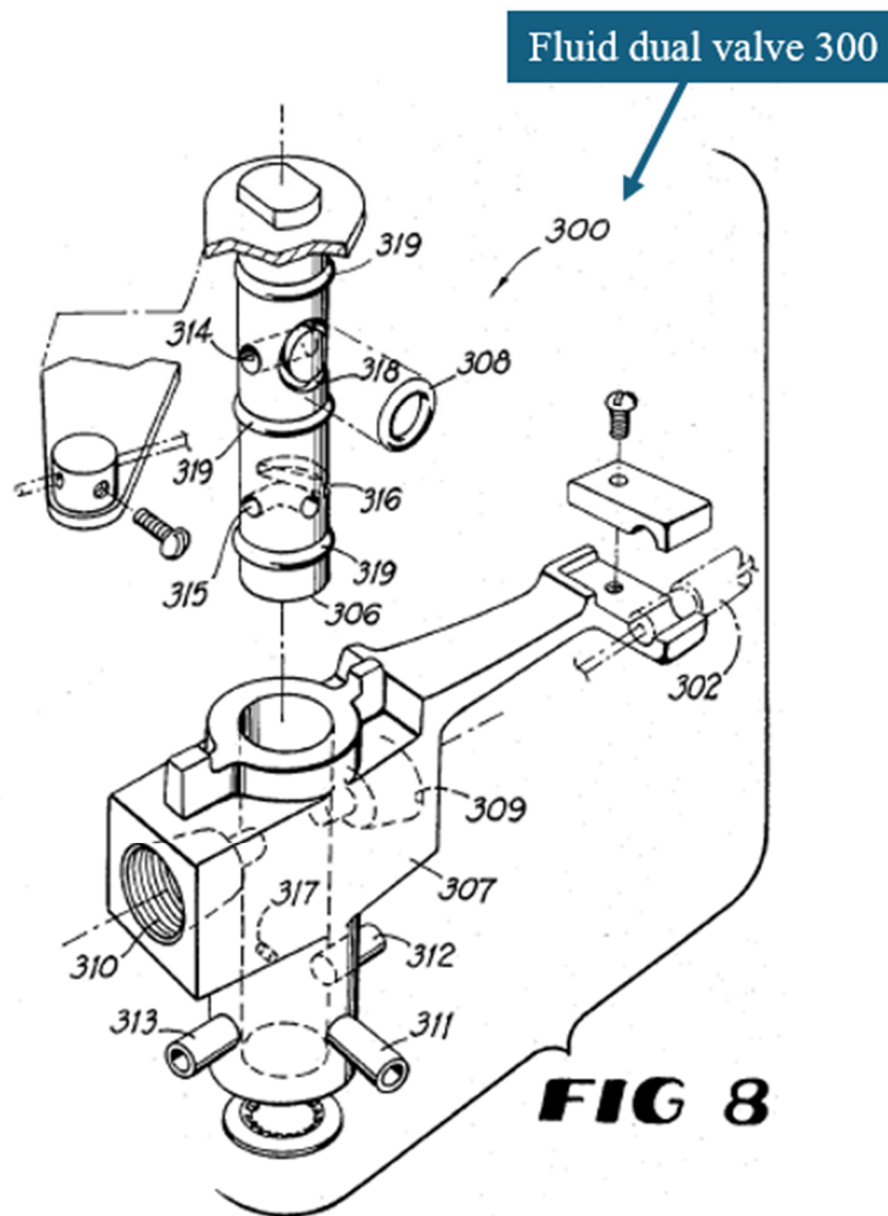
EX1008, Fig. 1.; EX1003, ¶113.

g. Element [1.6]

Chaudhari discloses selector switch 14 to control solenoid valves 4 and 13 for fuel selection. EX1008, 8-9.

It would have been obvious to replace Chaudhari's electronic valves with a mechanical system, such as Hallberg's. EX1003, ¶116.

Hallberg discloses a fluid dual valve 300, which is a mechanical fuel valve:

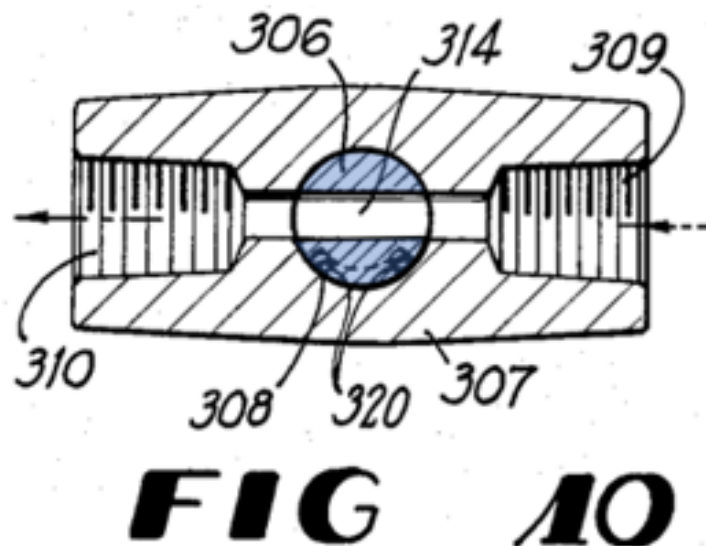


EX1006, Fig. 8, 7:5-7.

Positioning control 301 to “gasoline” causes control cable 302 to rotate spool 306 within valve body 307 such that gasoline from gasoline supply line 304 flows to carburetor 110 and the flow of propane is locked out. EX1006, 7:27-44. In

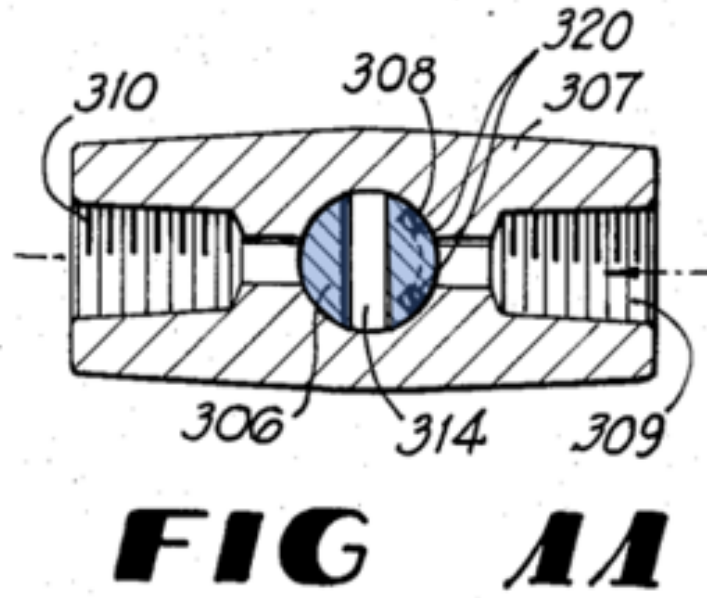
gasoline mode, liquid inlet opening 309 and liquid outlet opening 310

communicate through tunnel 314:



EX1006, Fig. 10, 7:40-7:43.

In “propane” mode of control 301, spool 306 rotates 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. EX1006, 8:3-10, Fig. 11. The seal between spool 306 and valve body 307 prohibits gasoline flow to carburetor 110:



EX1006, Fig. 11, 8:7-10.

In “propane” mode, duct 315 within spool 306 aligns to communicate with vacuum inlet port 311 and first vacuum outlet port 312. EX1006, 8:23-26, Fig. 13. Communicating vacuum inlet port 311 with first vacuum outlet port 312 connects converter vacuum line 30 (shown in Figure 1) to intake manifold 111, via intake manifold line 112:

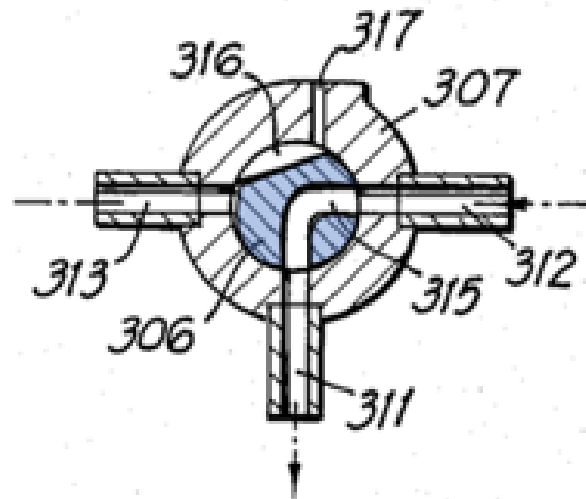


FIG 13

EX1006, Fig. 13, 8:26-30.

When the engine is started, a vacuum is created in line 30, urging diaphragm 10 upward against liquid inlet lever 8. EX1006, 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. EX1006, 8:38-42.

A POSA would have understood that Hallberg teaches a mechanical fuel valve actuatable between a first position (gasoline) and a second position (propane) to selectively control fuel flow to the engine from the liquid fuel source through the liquid fuel line and a pressurized fuel source fuel source through the gaseous fuel line as recited in Element [1.6]. EX1003, ¶122.

Combined with Chaudhari, the mechanical fuel valve 300 of Hallberg would selectively control the flow of fuel to Chaudhari's generator. EX1003, ¶124.

i. Motivation to Combine

A POSA would have been motivated to combine Hallberg's mechanical fuel valve with Chaudhari's generator. The electronic selection system of Chaudhari presents potential points of failure. EX1003, ¶125. A POSA would have recognized that a mechanical valve offers a more robust and reliable solution not prone to electrical failures such as coil burnout or wiring issues. *Id.* Mechanical valves are less susceptible to vibrations and environmental conditions common to generator operation, a key consideration for emergency power equipment like generators. *Id.*

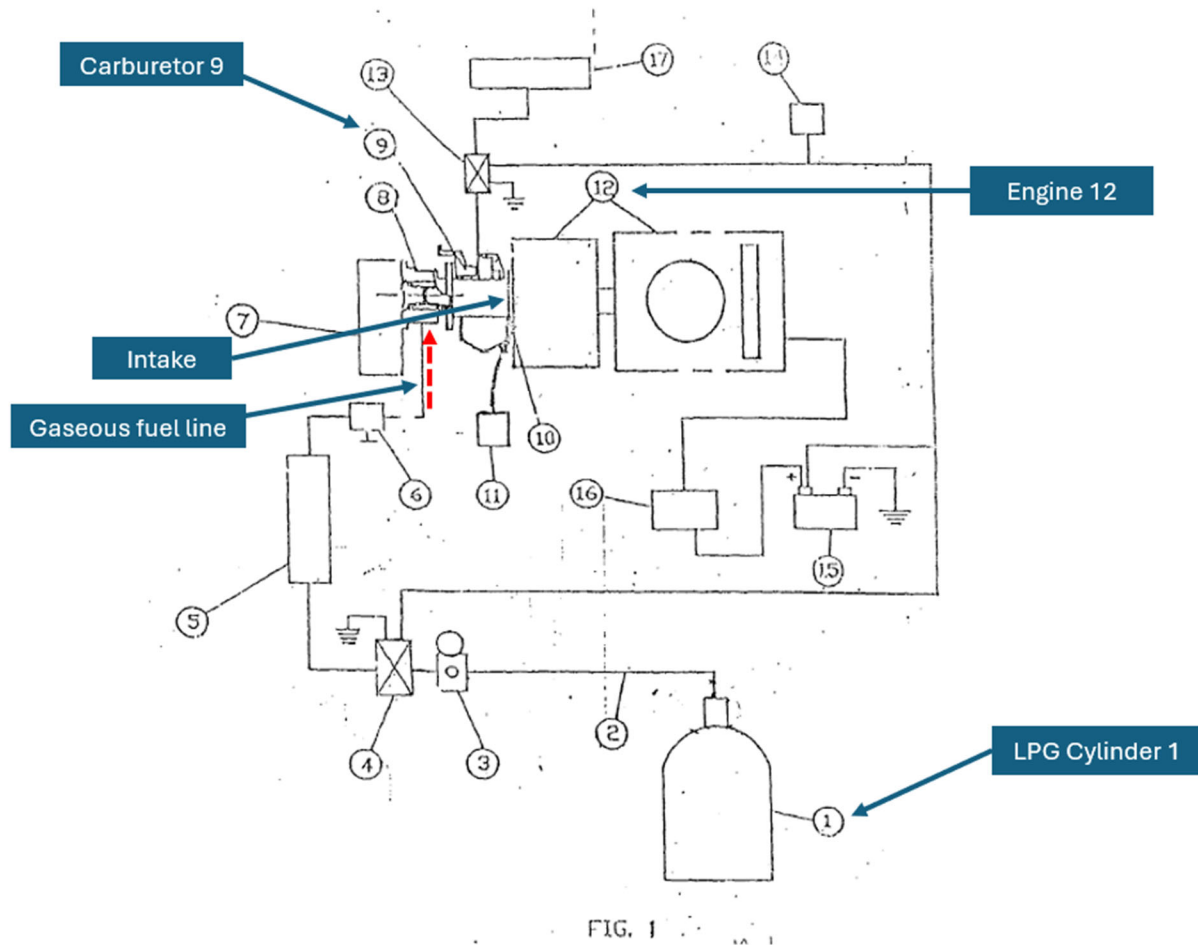
By incorporating Hallberg's valve 300, the electronic system of Chaudhari could be eliminated, making the generator easier to manufacture, assemble, and troubleshoot. *Id.*, ¶126.

ii. Expectation of Success

A POSA would have reasonably expected success in combining Hallberg's valve 300 with Chaudhari's generator. EX1003, ¶127. Both systems perform the same core function—selectively directing fuel from two sources to the engine. EX1003, ¶127. Mechanical fuel valves were well-known and widely used in fuel delivery systems, meaning a POSA would have no doubt that this combination would maintain the generator's ability to select between fuel sources. *Id.*

2. Claim 2

Chaudhari discloses carburetor 9 that connects the gaseous fuel line to the intake by way of gas-air mixer 8:



EX1008, Fig. 1, 7; EX1003, ¶129.

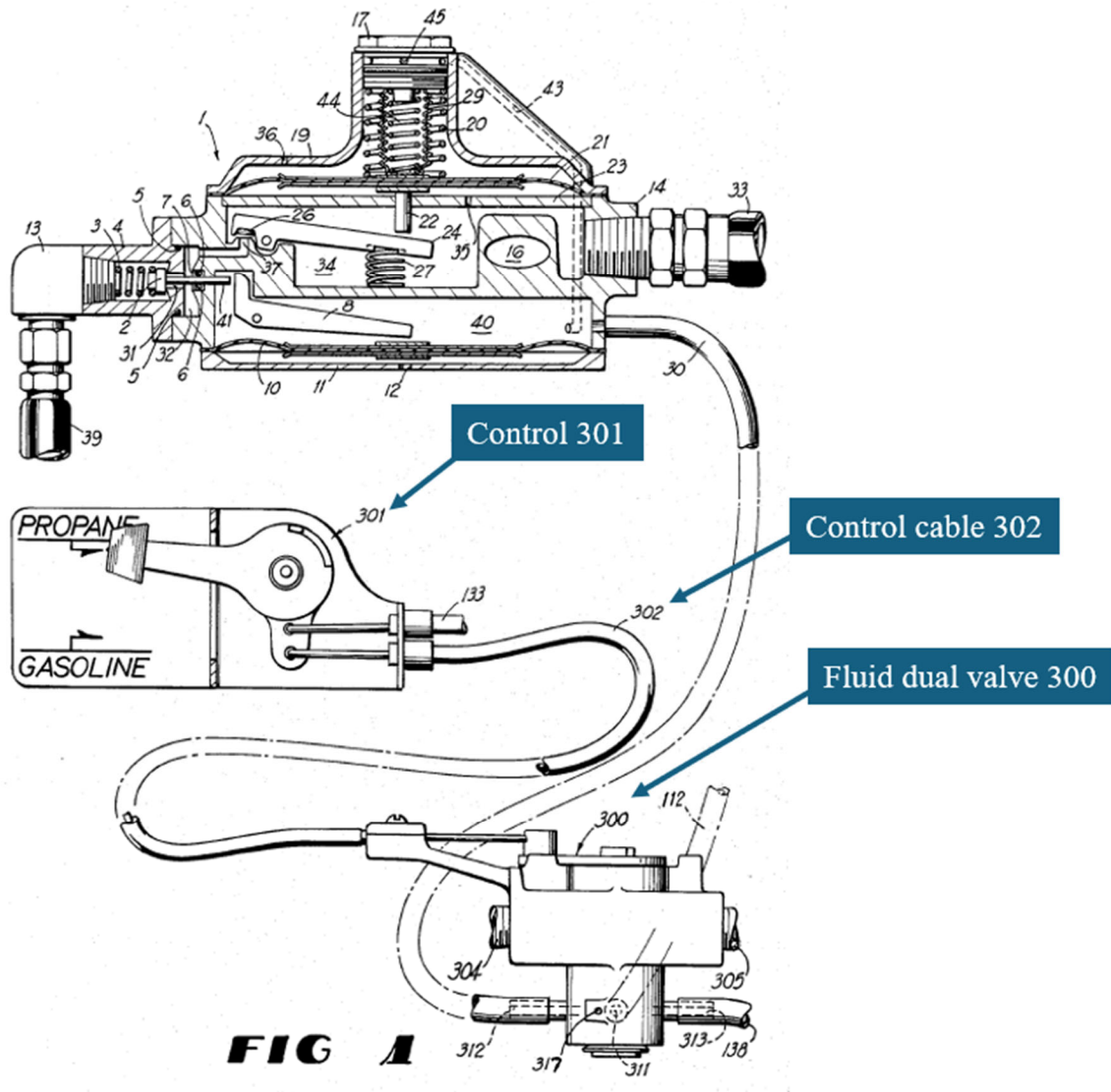
3. Claim 3

a. Element [3.1]

Hallberg discloses two structures, each of which teach a fuel lockout apparatus coupled to the mechanical fuel valve (fluid dual valve 300). Because the two additional structures are part of the same fuel control assembly that includes

the mechanical fuel valve, it would have been obvious to a POSA to combine Hallberg's fuel lockout apparatus with Chaudhari's generator for the same reasons as discussed. *Supra* §VII.A.1.g.; EX1003, ¶134.

First, Hallberg discloses a fuel lockout apparatus comprising control 301 and control cable 302. EX1006, 7:27-44; EX1003, ¶135. The fuel lockout apparatus comprising control 301 and control cable 302 is coupled to fluid dual valve 300. EX1006, 7:30-36, 8:3-9, Fig. 1; EX1003, ¶135. Positioning control 301 in "gasoline" mode acts through control cable 302 to permit gasoline to flow through fluid dual valve 300, and to lock out propane from flowing to the engine. *Supra* §VII.A.1.g. Positioning control 301 in "propane" mode acts through control cable 302 to permit propane to flow to the engine, and to lock out gasoline from flowing through fluid dual valve 300. *Supra* §VII.A.1.g.



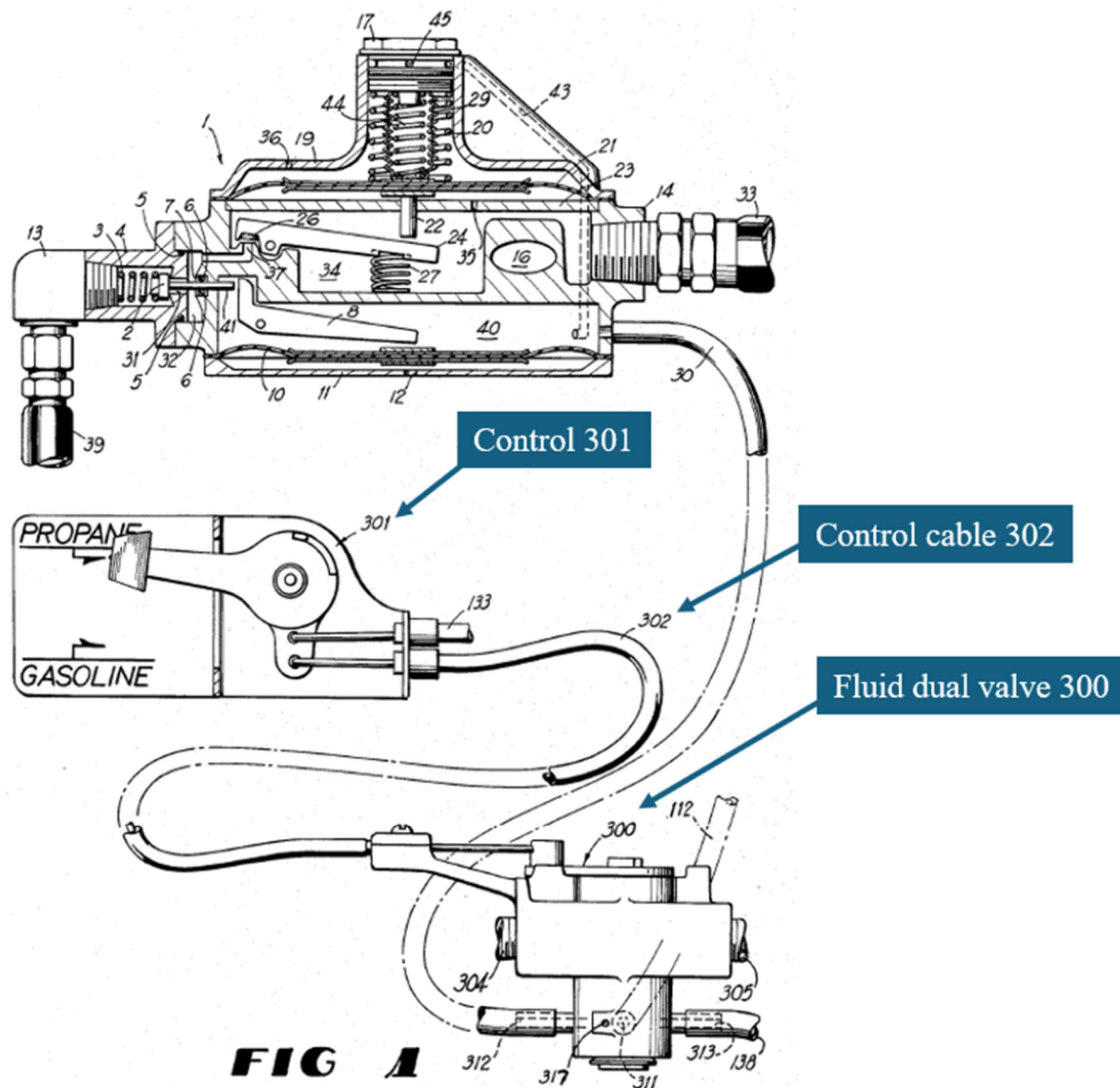
EX1006, Fig. 1.

Alternatively, Hallberg discloses a fuel lockout apparatus comprising a liquified fuel inlet valve 2, lever 8, fuel inlet shaft 41, diaphragm 10, and chamber 40. EX1003, ¶136; EX1006, 7:64-8:2; EX1003, ¶136. In propane mode, vacuum from the engine intake urges diaphragm 10 upward against liquid inlet lever 8, the opposite end of which drives inlet valve shaft 41 against bias spring 3 and opens liquid inlet valve 2. EX1006, 8:23-40, Fig. 1. Upon opening inlet valve 2, propane

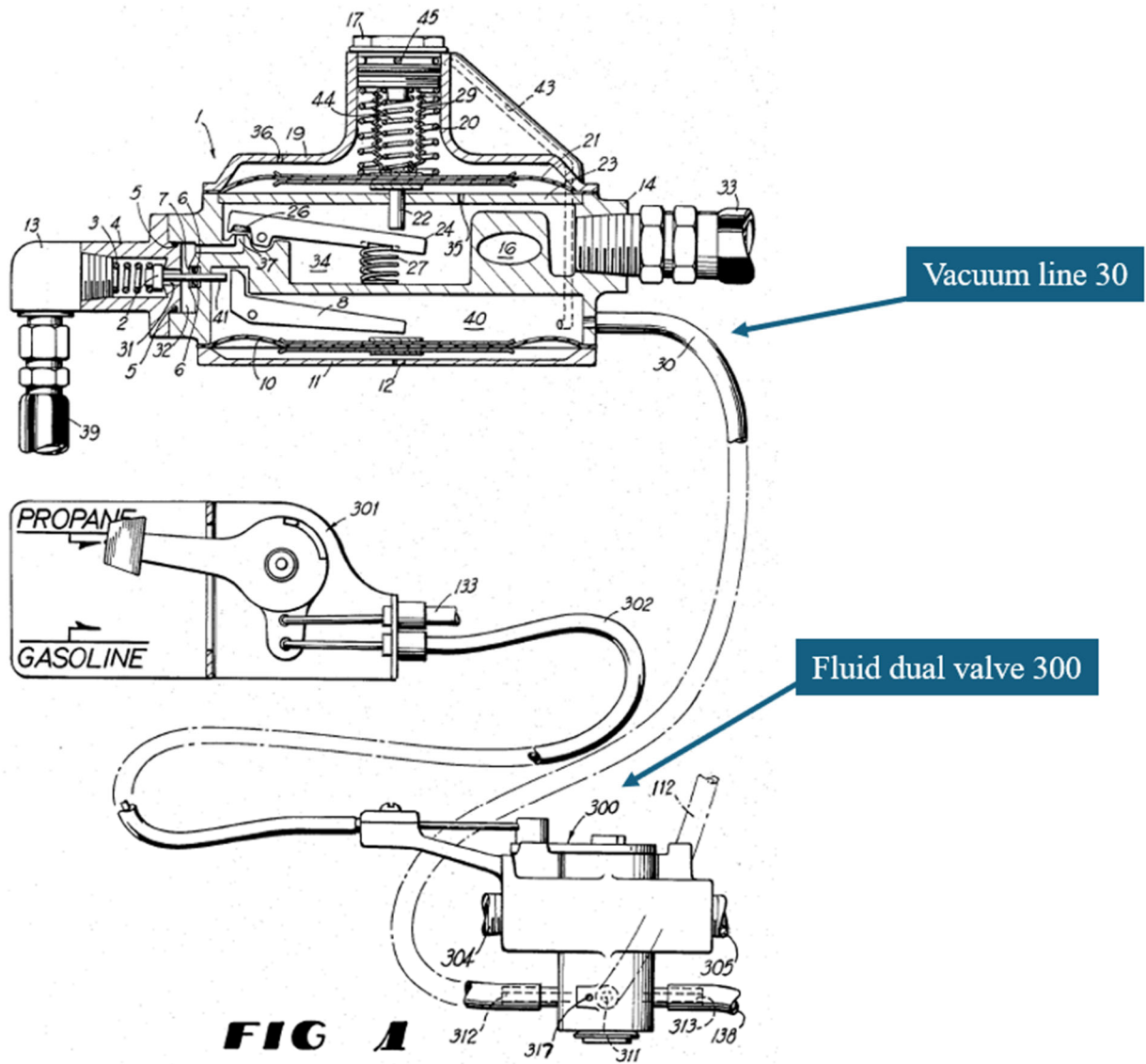
flows through the inlet valve orifice 31 into liquified fuel passage 32 and onto the mixer. EX1006, 8:40-60.

A POSA would have understood that the components of the fuel lockout apparatus (liquified fuel inlet valve 2, lever 8, fuel inlet shaft 41, diaphragm 10, and chamber 40) can be actuated/engaged to allow propane to flow through propane supply 39 to the engine. EX1003, ¶137. A POSA would have understood that if the components of the fuel lockout apparatus are not actuated/engaged, propane is not supplied to the engine. *Id.*

Hallberg discloses the fuel lockout apparatus is coupled to the mechanical fuel valve. *Id.*, ¶138. As shown in Figure 1, control cable 302 couples the fuel lockout apparatus (comprising control 301 and control cable 302) to the mechanical fuel valve (fluid dual valve 300). Without control cable 302, control 301 would be unable to rotate spool 306 within the valve body 307. EX1006, 7:30-33.



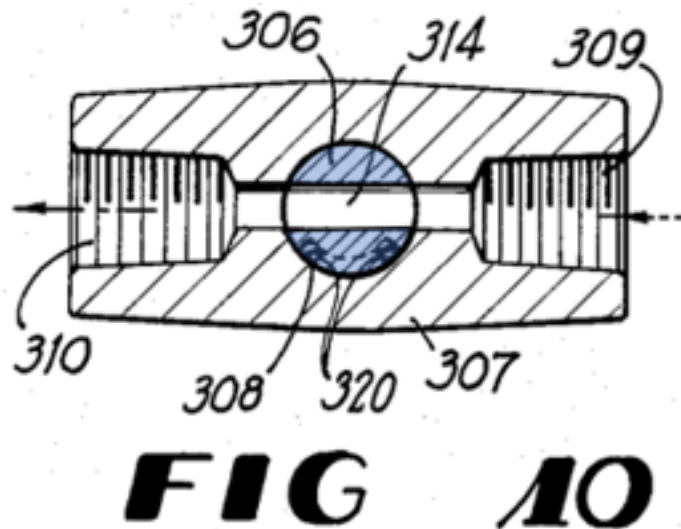
Alternatively, as shown in Figure 1, vacuum line 30 couples the fuel lockout apparatus (comprising liquified fuel inlet valve 2, lever 8, fuel inlet shaft 41, diaphragm 10, and chamber 40) to the mechanical fuel valve. Without vacuum line 30 receiving vacuum from vacuum outlet port 312, chamber 40 would be unable to actuate diaphragm 10, which engages lever 8, which drives inlet shaft 41 against bias spring 3 to open liquid inlet valve 2. EX1006, 8:23-42.



EX1006, Fig. 1.

b. Element [3.2]⁵

When Hallberg's control 301 selects gasoline, spool 306, within valve body 307, rotates and gasoline from gasoline supply line 304 flows to carburetor 110 through engine gasoline line 305. EX1006, 7:27-44. Gasoline is communicated through inlet opening 309, tunnel 314, and liquid outlet opening 310:



⁵ While claims 3, 25, and 35 discuss the “fuel lockout apparatus [communicating] the first fuel source” and “interrupting first fuel source communication,” the disclosure of the ’970 Patent associates this functionality with the mechanical fuel valve assembly. While these claims appear to be invalid under §112 as a result, to the extent they are construed to cover the structure disclosed in Figures 2-4B of the ’970 Patent, they are invalid over DuroMax and Elsdon, the combination of which discloses the same structure.

EX1006, Fig. 10.

In gasoline mode, the fuel lockout apparatus prevents the flow of propane to the engine. *Supra* §§VII.A.1.g, VII.A.3.a. A POSA would have understood that when the mechanical fuel valve is in the first position, the fuel lockout apparatus communicates the liquid fuel source to the generator and prevents the pressurized fuel source from coupling to the generator. EX1003, ¶142.

When control 301 selects propane, propane flows to the engine. EX1006, 7:27-44, 8:3-30. In propane mode, spool 306 rotates within valve body 307 to form a seal to prevent gasoline flow 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. *Supra* §§VII.A.1.g, VII.A.3.a. A POSA would have understood that when the mechanical fuel valve is in a second position, the fuel lockout apparatus permits the propane source to couple to the generator and interrupts the liquid fuel source communication with the generator. EX1003, ¶¶143-144.

4. Claim 4

a. Element [4.1]

Chaudhari in combination with Hallberg discloses this element. *Supra* §VII.A.1.g; EX1003, ¶147.

b. Element [4.2]

Chaudhari in combination with Hallberg discloses this element. *Supra* §VII.A.3; EX1003, ¶149.

5. Claim 5

Chaudhari in combination with Hallberg discloses this element. *Supra* §§VII.A.1.g, VII.A.3. Control 301 prevents the mechanical fuel valve from opening the liquid fuel line while the engine receives fuel from the pressurized fuel source. *Id.*; EX1003, ¶151.

6. Claim 34

a. Element [34.0]

Chaudhari discloses this element. *Supra* §VII.A.1.a.

b. Element [34.1]

Chaudhari discloses this element. *Supra* §VII.A.1.b.

c. Element [34.2]

Chaudhari discloses this element. *Supra* §VII.A.1.d.

d. Element [34.3]

Chaudhari discloses this element. *Supra* §VII.A.1.e.

e. Element [34.4]

Chaudhari discloses this element. *Supra* §VII.A.1.f.

f. Element [34.5]

Chaudhari in combination with Hallberg discloses this element. *Supra* §VII.A.1.g.

g. Element [34.6]

Chaudhari in combination with Hallberg discloses a mechanical fuel valve that supplies gaseous fuel to the carburetor of the generator in “propane” mode by connecting intake manifold vacuum line 112. *Supra* §VII.A.1.g; EX1003, ¶165.

7. Claim 35

a. Element [35.1]

Chaudhari in combination with Hallberg discloses this element. *Supra* §VII.A.3.a.

b. Element [35.2]

Chaudhari in combination with Hallberg discloses this element. *Supra* §VII.A.3.b.

8. Claim 36

a. Element [36.1]

Chaudhari in combination with Hallberg discloses this element. *Supra* §VII.A.4.a.

b. Element [36.2]

Chaudhari in combination with Hallberg discloses this element. *Supra* §VII.A.4.b.

9. Claim 37

Chaudhari in combination with Hallberg discloses this element. *Supra* §VII.A.5.

B. Ground 2: Claims 12-14, 44, 48, and 50-51 are obvious over Chaudhari in view of Hallberg and Jungmann

These claims are obvious under §103, as detailed below and in the declaration of Dr. Morse. EX1003, ¶¶178-233.

Of these claims, claims 50-51 are obvious under Patent Owner's proposed constructions.

1. Claim 12

a. Element [12.0]

Chaudhari discloses this element. *Supra* §VII.A.1.a.

b. Element [12.1]

Chaudhari discloses this element in combination with Jungmann. *Supra* §VII.A.1.b; below discussion.

It would have been obvious to use an alternator as Chaudhari's generator (driven by Chaudhari's engine) and to mount the alternator and Chaudhari's engine within a generator housing, as taught by Jungmann. EX1003, ¶184.

Jungmann discloses a generator with alternator 14 driven by engine 12 and mounted within housing 18. EX1021, ¶¶[0002] [0016], Fig. 1.



EX1021, Fig. 1.

A POSA would have been motivated to use an alternator as Chaudhari's generator because an alternator was a common type of electrical generator at the time of the invention. EX1003, ¶186.

A POSA would have reasonably expected success in using an alternator within Chaudhari's generator as demonstrated by Jungmann. *Id.*, ¶187. Moreover, it was common and well known by that time to use alternators to convert mechanical energy from an engine into electricity (for example, alternators are commonly combined with car engines to generate electricity). *Id.*

A POSA would have been motivated to mount the alternator and Chaudhari's engine within a housing, as taught by Jungmann, to provide protection, noise reduction, portability, and aesthetics. *Id.*, ¶188. It was common at the time of the invention to mount the components of a generator within a housing, as shown by Jungmann (and DuroMax). EX1021, Fig. 1; EX1004, 1; EX1003, ¶188. This would improve usability and safety in various environments, including harsh weather conditions. EX1003, ¶188.

A POSA would have reasonably expected success in mounting the alternator and engine within a housing, as demonstrated by Jungmann (and DuroMax). EX1021, Fig. 1; EX1004, 1; EX1003, ¶189.

c. Element [12.2]

Chaudhari discloses this element. *Supra* §VII.A.1.d.

d. Element [12.3]

Chaudhari discloses this element. *Supra* §VII.A.1.e.

e. Element [12.4]

Chaudhari discloses this element. *Supra* §VII.A.1.f.

f. Element [12.5]

Chaudhari in combination with Hallberg discloses this element. *Supra* §VII.A.1.g.

g. Element [12.6]

Chaudhari discloses this element. *Supra* §VII.A.1.d.

2. Claim 13

It would have been obvious to mount Chaudhari's engine/generator within a housing. *Supra* §VII.B.1.b.

It would have been obvious to a POSA to mount the mechanical fuel valve on or within the housing, as taught by Jungmann's mounting of its valve 30:

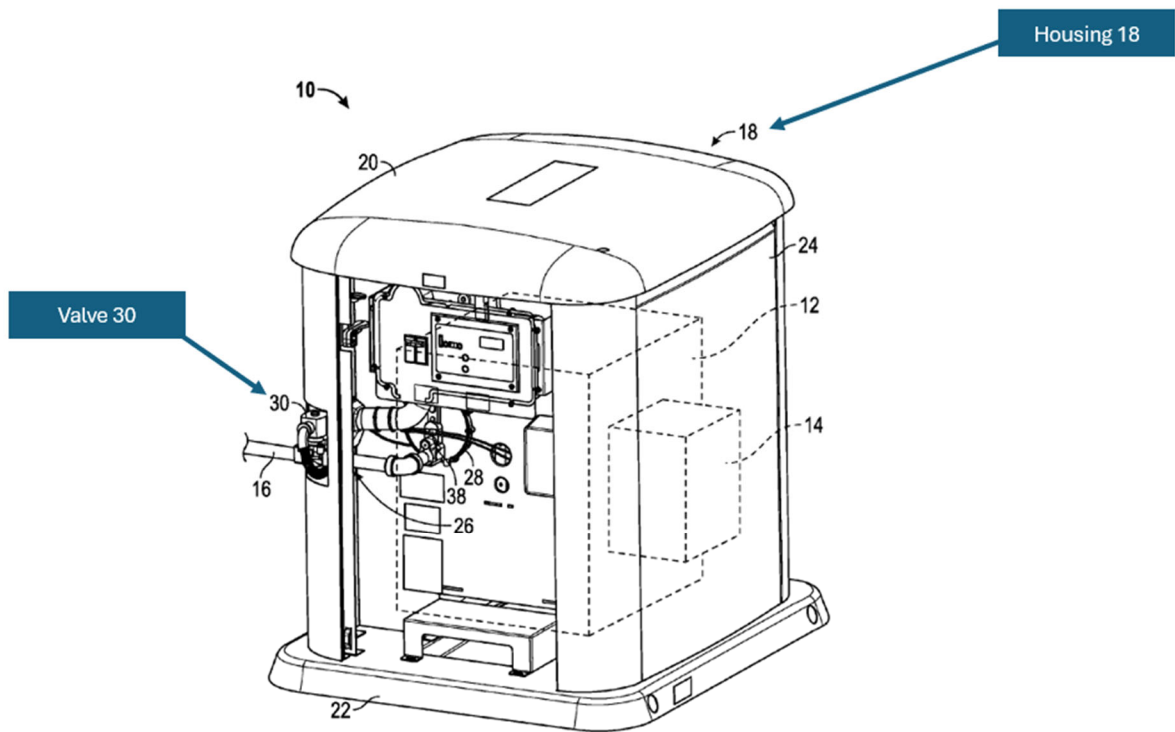


FIG. 1

EX1021, Fig. 1; EX1003, ¶202.

a. Motivation/Expectation of Success

A POSA would have been motivated to mount the valve on something, otherwise it would be dangling from the fuel lines, which could cause damage when moving or installing the generator. EX1003, ¶203. A POSA would have been

motivated to mount the valve on the housing, as taught by Jungmann, to allow easy access for service or replacement. *Id.* Alternatively, a POSA would have been motivated to mount the valve within the housing to protect it from harsh weather conditions. *Id.* Both locations would have been logical choices to a POSA. *Id.*

A POSA would have reasonably expected success in mounting the valve on or within the housing based on Jungmann, and because mounting valves on or within housings of appliances and other equipment was common at the time of the invention. *Id.*, ¶204.

3. Claim 14

a. Element [14.1]

Chaudhari discloses this element. *Supra* §§VII.A.1.e, VII.B.1.d.

b. Element [14.2]

Chaudhari discloses this element. *Supra* §§VII.A.1.f, VII.B.1.e.

4. Claim 44

a. Element [44.0]

Chaudhari discloses this element. *Supra* §VII.A.1.a.

b. Element [44.1]

Chaudhari in combination with Jungmann discloses this element. *Supra* §VII.B.1.b.

c. Element [44.2]

Chaudhari in combination with Jungmann discloses this element. *Supra* §§VII.A.1.b, VII.B.1.b.

d. Element [44.3]

Chaudhari discloses this element. *Supra* §§VII.A.1.b-VII.A.1.c.

e. Element [44.4]

Chaudhari discloses this element. *Supra* §§VII.A.1.b, VII.A.2.

f. Element [44.5]

Chaudhari in combination with Hallberg discloses this element. *Supra* §VII.A.1.g.

g. Element [44.6]

Chaudhari discloses this element. *Supra* §VII.A.1.d.

5. Claim 48

Hallberg's fluid dual valve 300 is a liquid fuel valve coupled to the liquid fuel line and a gaseous fuel valve coupled to the gaseous fuel line (gaseous fuel line 33) via vacuum line 30. *Supra* §VII.A.1.g.

6. Claim 50

a. Element [50.1]

Chaudhari in combination with Hallberg discloses this element. *Supra* §VII.A.4.a.

b. Element [50.2]

Chaudhari in combination with Hallberg discloses this element. *Supra* §VII.A.4.b.

7. Claim 51

Chaudhari in combination with Hallberg discloses this element. *Supra* §VII.A.5.

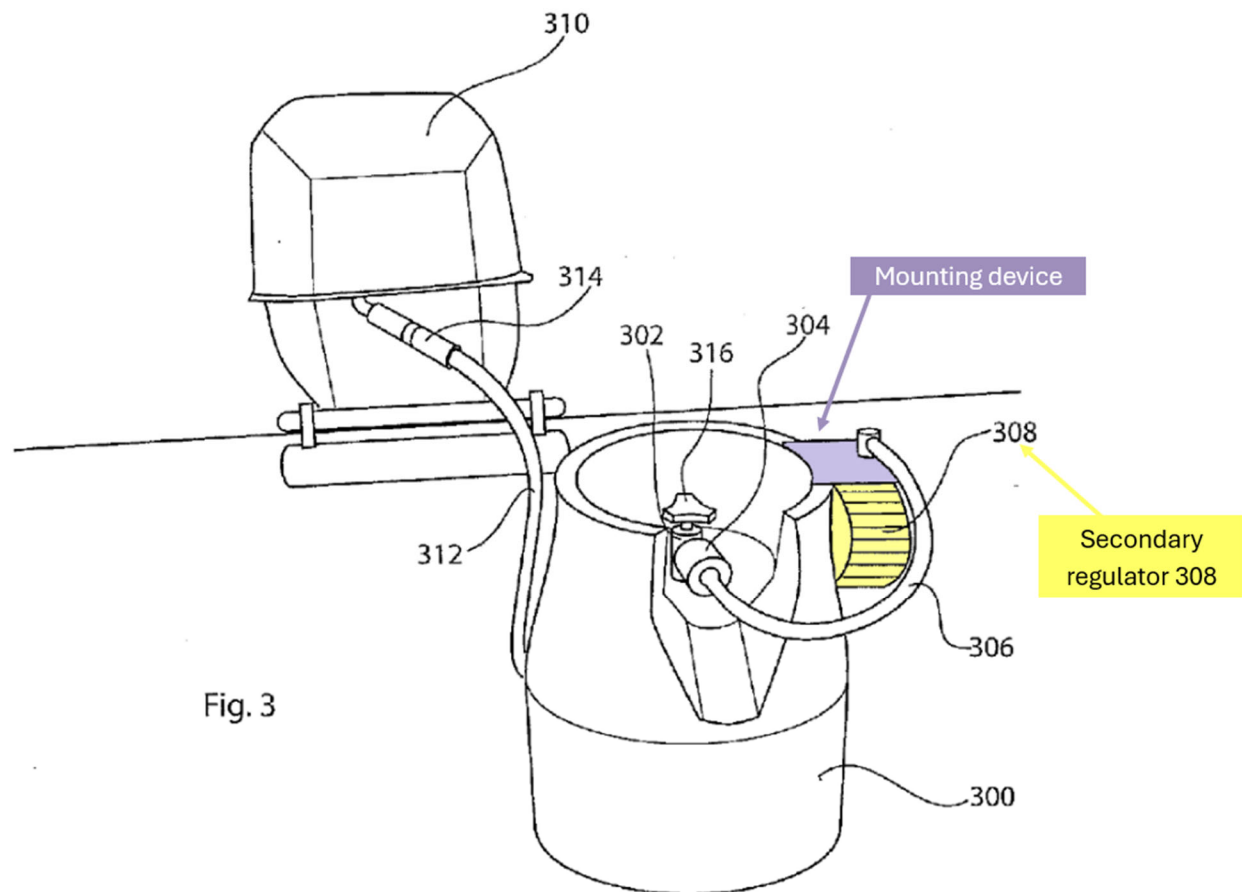
C. Ground 3: Claims 8-11, 16-19, and 40-43 are obvious over Chaudhari in view of Hallberg, Jungmann, and Parlatore

These claims are obvious under §103, as detailed below and in the declaration of Dr. Morse. EX1003, ¶¶234-276.

1. Claim 8

It would have been obvious to mount Chaudhari's secondary pressure regulator on a regulator mounting device of a LPG tank, as disclosed by Parlatore. EX1003, ¶236.

Parlatore discloses primary pressure regulator 304 coupled to a LPG tank and secondary pressure regulator 308 mounted on a mounting device secured to the LPG tank:



EX1010, Fig. 3; EX1003, ¶235.

a. Motivation/Expectation of Success

A POSA would have been motivated to mount the secondary pressure regulator to the tank to avoid straining the connections between the second-stage regulator and the tank from the weight of the regulator. EX1003, ¶238.

Mounting the regulator directly to the tank ensures that any potential leaks or failures in the high-pressure section occur at the tank, far from the generator and its ignition sources. *Id.*, ¶239. This reduces the risk of fire or explosion, a critical consideration given propane's flammability. *Id.* Also, generators vibrate during

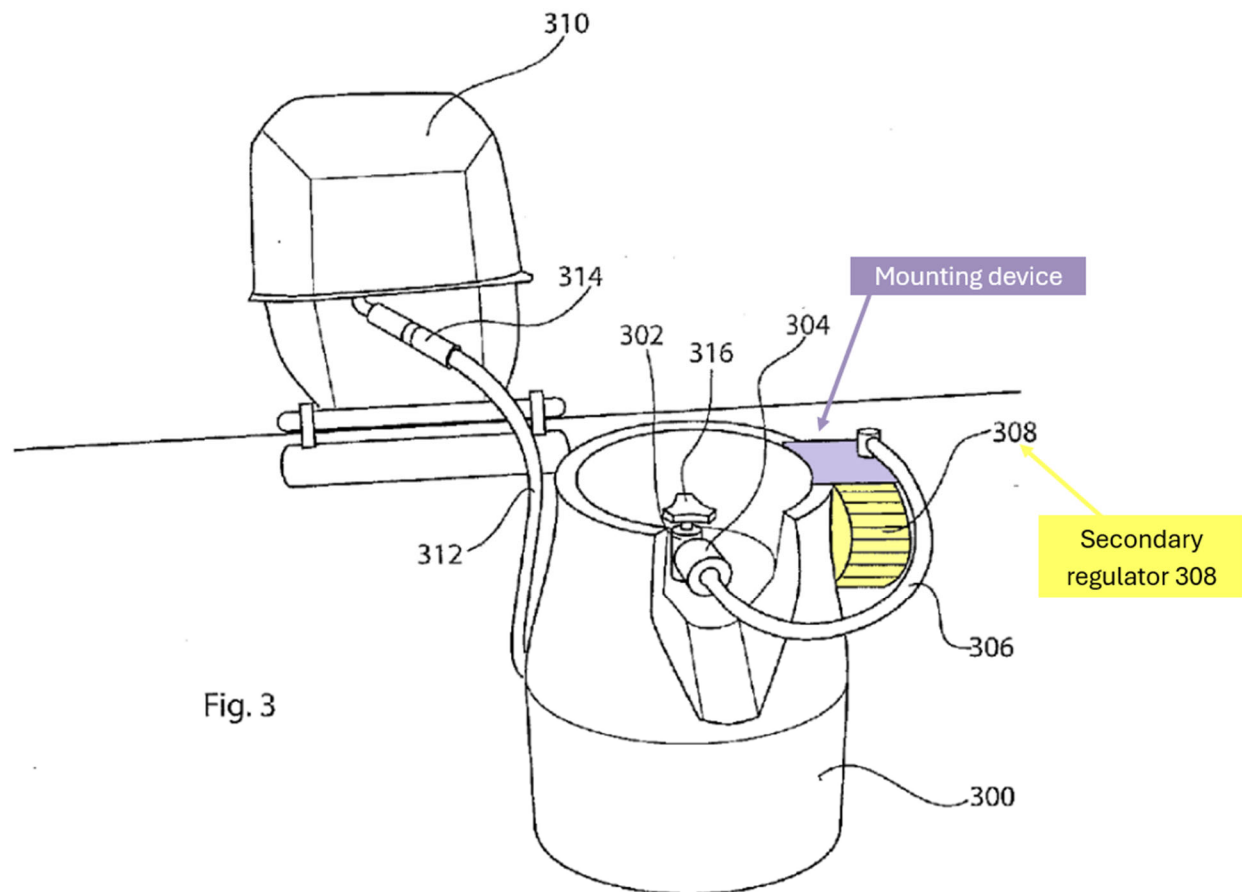
operation, which can stress regulator components and lead to wear or failure. Attaching the regulator to a stationary tank protects it from these vibrations, improving safety and durability. *Id.*

Additionally, mounting a regulator on the tank minimizes the length of high-pressure hose needed between the tank and the regulator. *Id.*, ¶240. This simplifies the fuel system and lowers the risk of damage to the high-pressure hose. *Id.*

Parlatore shows that a POSA would have reasonably expected success mounting the secondary regulator to the tank. EX1010, Fig. 3; EX1003, ¶241.

2. Claim 9

Parlatore discloses that at least the secondary pressure regulator 308 is mounted on a mounting device secured to the tank:



EX1010, Fig. 3; EX1003, ¶243.

Parlatore also discloses the primary and secondary regulators can be combined as a single, two-stage regulator. EX1010, ¶[0018]. Parlatore discloses the combined, two-stage regulator 202 may be used “[i]n further exemplary embodiments,” such that Parlatore also teaches the use of combined, two-stage regulator with the off-board embodiment shown in Figure 3. EX1010, ¶[0018], EX1003, ¶244.

Using the same mounting arrangement from Figure 3 with the combined regulator 202 (instead of separate regulators), the primary pressure regulator would also be mounted on the mounting device. EX1010, Fig. 3; EX1003, ¶245.

Alternatively, this configuration would have been obvious. EX1003, ¶246.

a. Motivation/Expectation of Success

A POSA would have been motivated to use a combined, dual-stage regulator, such as Parlatores combined regulator 202, rather than Chaudhari's two, separate regulators. *Id.*, ¶247. A POSA would have been motivated to use a dual-stage regulator with the embodiment of Figure 3 because dual-stage regulators were readily available at the time of the invention, and it would be more practical, more compact and lighter to use a single component (a dual-stage regulator) rather than two components (separate primary and secondary regulators) to achieve the same purpose. *Id.* They are particularly advantageous in portable generator applications, where minimizing the physical footprint simplifies design and installation. *Id.*

Additionally, installing one combined unit with fewer connections is faster and less complex than setting up two separate regulators, which require precise connections and alignment. *Id.*, ¶248. This simplicity reduces the likelihood of errors, such as utilizing components with improper pressure ratings or failing to fully tighten connections, making it a practical choice for both manufacturers and

end-users. *Id.* Further, a combined dual-stage regulator ensures that the first stage and the second stage work seamlessly together. *Id.* The pre-calibrated setup delivers stable output pressure without the need for manual adjustments that two separate regulators may require. *Id.*

A POSA would have reasonably expected success replacing Chaudhari's two, separate regulators with a combined, dual-stage regulator (such as Parlature's combined regulator 202) because they operate in the same manner and achieve the same outcome as two regulators in series and were commonly used for similar applications at the time of the invention. *Id.*, ¶249.

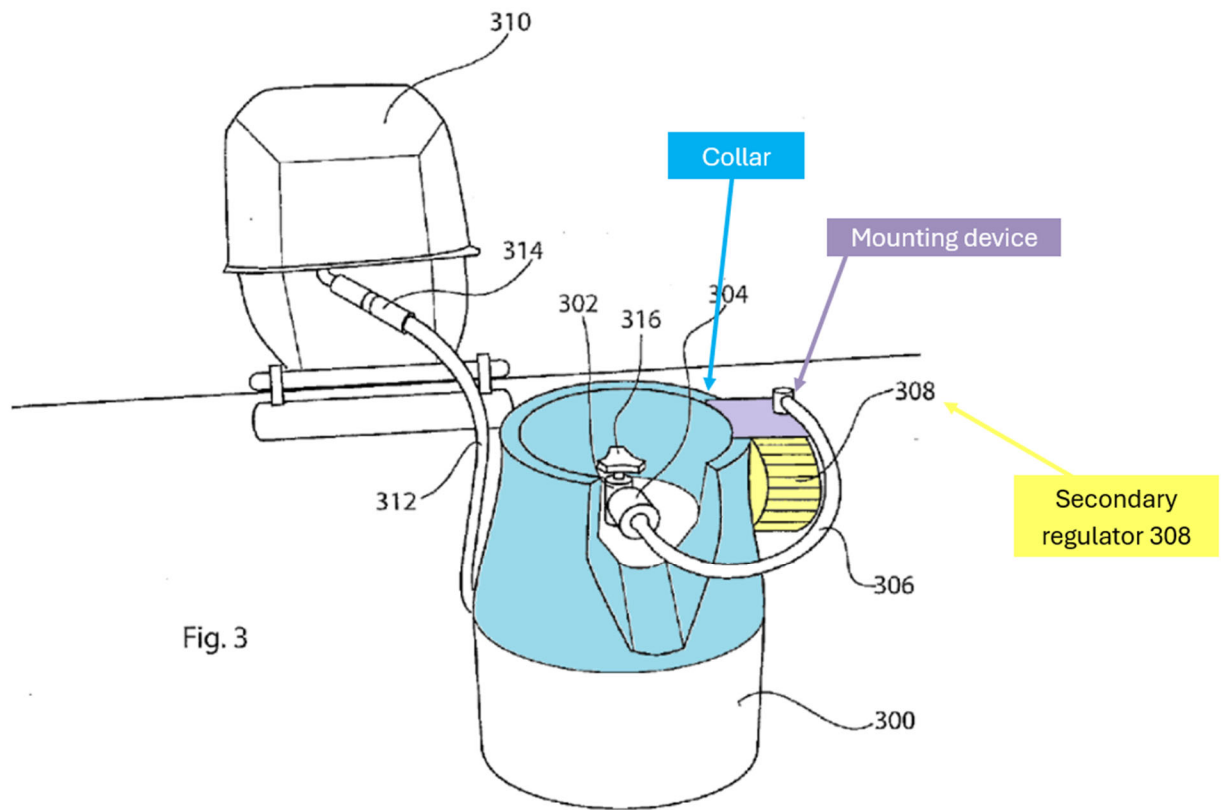
A POSA would have been motivated to mount the dual-stage regulator to the tank (in the same way shown in Figure 3) for the same reasons as mounting the secondary regulator to the tank: to avoid straining the connections between the dual-stage regulator and the tank from the weight of the dual-stage regulator; to ensure that any potential leaks or failures in the high-pressure section occur at the tank and away from the generator and its ignition sources; to protect the dual-stage regulator from damage caused by vibration from the generator; and to minimize the length of high-pressure hose needed between the tank and the regulator. *Id.*, ¶250.

Parlature shows that a POSA would have reasonably expected success mounting the secondary regulator to the tank, and mounting a combined, dual-

stage regulator would be no different and would not have an impact on the performance of the fuel delivery system. EX1010, Fig. 3; EX1003, ¶251.

3. Claim 10

Parlatore discloses the mounting device secures to the collar of the propane tank:



EX1010, Fig. 3; EX1003, ¶253.

Parlatore also discloses the primary and secondary regulators can be combined as a single, two-stage regulator 202. EX1010, ¶[0018]. Using the same mounting arrangement from Figure 3 with the combined regulator 202 (replacing the secondary regulator 308), both the primary and secondary pressure regulators

(as part of the combined regulator) would also be mounted on the mounting device on the collar. EX1003, ¶254.

Alternatively, this configuration would have been obvious. *Supra* §VII.C.2.

In this configuration, the primary and secondary pressure regulators would be positioned adjacent each other along an outer periphery of the collar. EX1010, Fig. 3; EX1003, ¶256.

4. Claim 11

It would have been obvious to a POSA to use a combined, dual-stage regulator with Chaudhari's generator, as opposed to using Chaudhari's two separate regulators, based on the teachings of Parlato. *Supra* §VII.C.2.

Parlato discloses "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." EX1010, ¶[0018]; *see also* EX1010, claim 8, Fig. 2. In this way, the primary regulator and secondary regulator are integral components of a dual-stage pressure regulator. EX1010; EX1003, ¶259.

The primary regulator within the combined regulator 202 regulates the gaseous fuel supplied from the pressurized fuel source to a reduced stage. EX1010, ¶¶[0005]-[0006], [0016]-[0022]; EX1003, ¶260. The secondary regulator within the combined regulator 202 further regulates the gaseous fuel from the primary regulator for delivery to the engine. EX1003, ¶260.

5. Claim 16

This element is disclosed. *Supra* §VII.C.1.

6. Claim 17

This element is disclosed and was obvious. *Supra* §VII.C.3.

7. Claim 18

This element is disclosed. *Supra* §VII.C.4.

8. Claim 19

This element is disclosed and was obvious. *Supra* §VII.C.2.

9. Claim 40

This element is disclosed. *Supra* §VII.C.1.

10. Claim 41

This element is disclosed and was obvious. *Supra* §VII.C.2.

11. Claim 42

This element is disclosed and was obvious. *Supra* §VII.C.3.

12. Claim 43

This element is disclosed. *Supra* §VII.C.4.

D. Ground 4: Claims 7, 15, 20-27, 29-33, 39, 45-46, and 49 are obvious over Chaudhari in view of Hallberg, Jungmann, Parlatores, LP-Gas Handbook, Sturgis, and Tri-Fuel Video

These claims are obvious under §103, as detailed below and in the declaration of Dr. Morse. EX1003, ¶¶277-359.

Of these claims, claims 25-27 are obvious under Patent Owner's proposed constructions.

1. Claim 7

It would have been obvious to use Parlature's Figure 3 configuration with Chaudari's generator. *Supra* §VII.C.1.

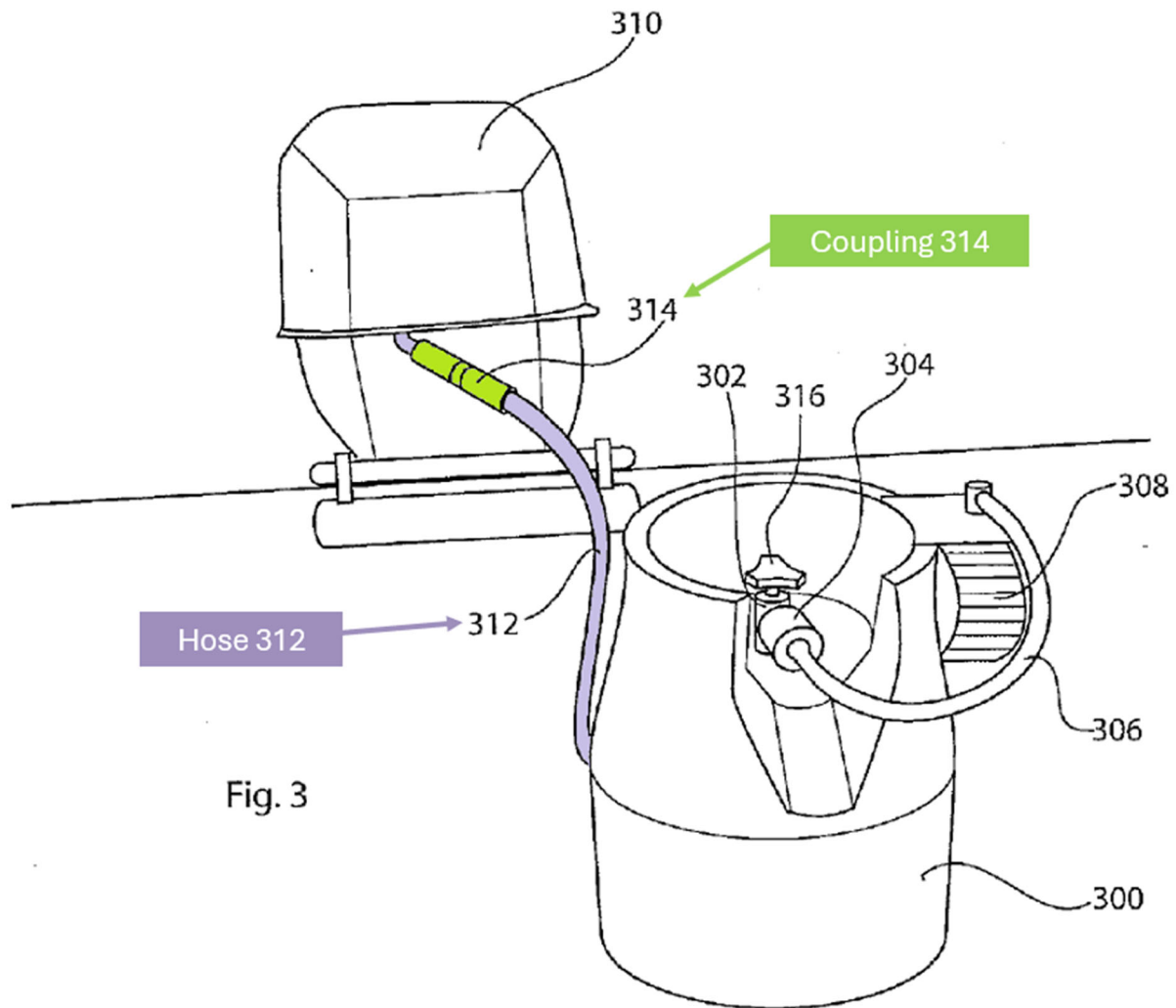
Chaudhari and Parlature do not explicitly disclose which type of hose coupling they use. However, LP-Gas Handbook discloses the use of quick-connect couplings in LP-gas systems. EX1017, 40 (§3.3.62 commentary: "Quick connectors are also used in other LP-Gas systems, such as those used for engine fuel refueling and cylinder filling, connecting cylinders to gas-fired barbecue grills, and connecting gas systems between two sections of mobile homes.").

It would have been obvious to a POSA to use a quick-connect at the end of the Parlature hose (e.g., as coupling 314) in view of the teachings of LP-Gas Handbook. EX1003, ¶282.

i. Motivation/Expectation of Success

A POSA would have been motivated to use a quick connector because Parlature states that the secondary regulator may be connected to the carburetor or engine "either permanently or releasably" (EX1010, ¶[0020]) and refers to "releasably coupling the second regulator to the engine" (EX1010, claim 10, 15). EX1003, ¶283.

A POSA would have understood that a quick-connect could be used to achieve the releasable connection as coupling 314:



EX1010, Fig. 3; EX1003, ¶284.

As such, a first end would be coupled to the outlet of the secondary regulator and a second end would be coupled to an inlet of the gaseous fuel line of Chaudhari's engine to couple the secondary pressure regulator to the gaseous fuel line. EX1003, ¶285.

At the time of the invention, quick-connect couplings were a standard, well-understood solution for fuel lines where connections need to be secure but detachable, safe against leaks, and tool-free for ease of service. EX1003, ¶286; EX1017, 40 (§3.3.62: “**Quick Connectors.** Fittings used to connect hose assemblies to piping and valves without the use of tools.”).

A POSA would have been motivated to use a quick connector for easy connection and disconnection of the LPG tank for refilling the tank or replacing an empty tank with a full tank. EX1003, ¶287. A POSA would have been motivated to provide for easy connection/disconnection so that the tank could be used for other common applications when not in use by the generator, such as a BBQ grill. *Id.* A POSA would have been motivated to use a quick connector to allow easy and rapid connection/disconnection so that the portable generator could be more easily moved to other locations or could be stored when not in use. *Id.*

Additionally, many quick connectors stop gas flow when disconnected, preventing propane from escaping during tank swaps or maintenance. *Id.*, ¶288. This is especially valuable in off-board regulator setups. *Id.*

Quick connectors also allow users to connect and disconnect the hose effortlessly, making them ideal for non-experts using portable generators in residential or emergency settings. *Id.*, ¶289. This minimizes downtime when

replacing the propane tank, which is common in extended generator use or mobile applications. *Id.*

A POSA would have reasonably expected success because quick connectors were commonly used in propane and fuel systems, including portable setups like those described in Parlatore. EX1003, ¶290; EX1017, 40 (§3.3.62 commentary). The benefits of a quick-connect coupling, such as rapid setup, easy maintenance, and safety, would have been especially attractive in systems that were meant to be modular or portable (like Parlatore’s Figure 3 configuration). *See* EX1010, Fig. 3; EX1003, ¶290.

2. Claim 15

This element is disclosed. *Supra* §VII.D.1.

3. Claim 20

a. Element [20.0]

Chaudhari discloses this element. *Supra* §VII.A.1.a.

b. Element [20.1]

Chaudhari discloses this element. *Supra* §VII.A.1.b.

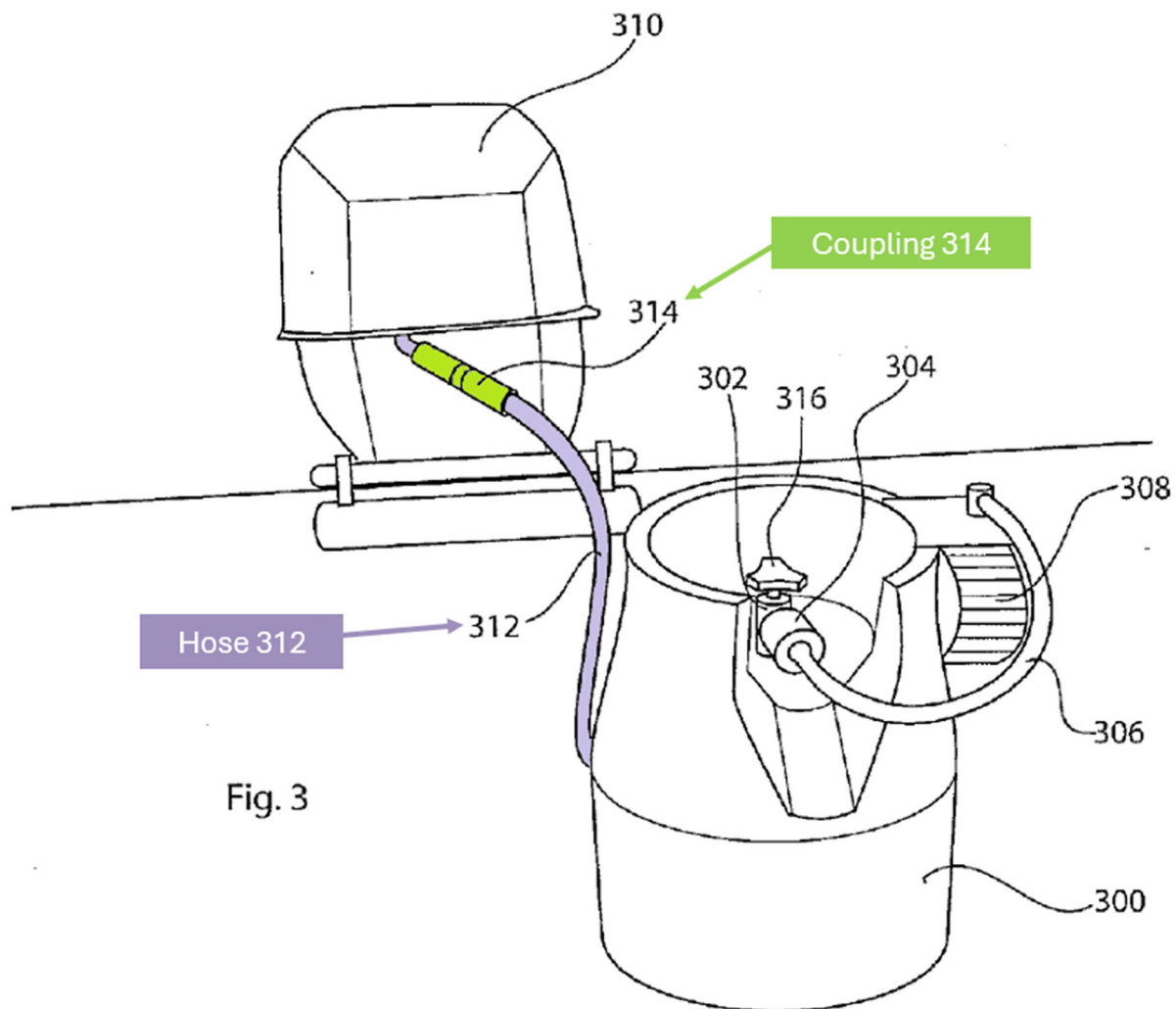
c. Element [20.2]

It would have been obvious to use a quick-connect to connect a LPG tank to Chaudhari’s generator. *Supra* §VII.D.1.

A quick-connect typically has an integral valve and a POSA would have been aware of quick-connects with integral valves. EX1003, ¶299. Sturgis

discloses an example of a quick-connect for gas (natural gas or LPG) with an integral valve (first valve 41). EX1023, 1:6-10, 4:6-13, 32-52, Figs. 2/2A/2B; *see also* EX1024, 8; EX1025, 3; EX1003, ¶300.

The valve of the quick-connect would be a gaseous fuel valve for purposes of this claim. EX1003, ¶302. When using a quick-connect as Parlatores coupling 314, the valve of the quick-connect would be coupled to an inlet of the gaseous fuel line to the Chaudhari engine and would be “connectable” to an LPG tank:



EX1010, Fig. 3; EX1003, ¶302.

In addition, Hallberg's fluid dual valve 300 is a gaseous fuel valve that would be coupled to Chaudhari's gaseous fuel line and connectable to the LPG tank. *Supra* §VII.A.1.g; EX1003, ¶303.

d. Element [20.3]

Chaudhari in combination with Hallberg discloses this element. *Supra* §VII.A.1.g

e. Element [20.4]

Chaudhari discloses this element. *Supra* §VII.A.1.d.

f. Element [20.5]

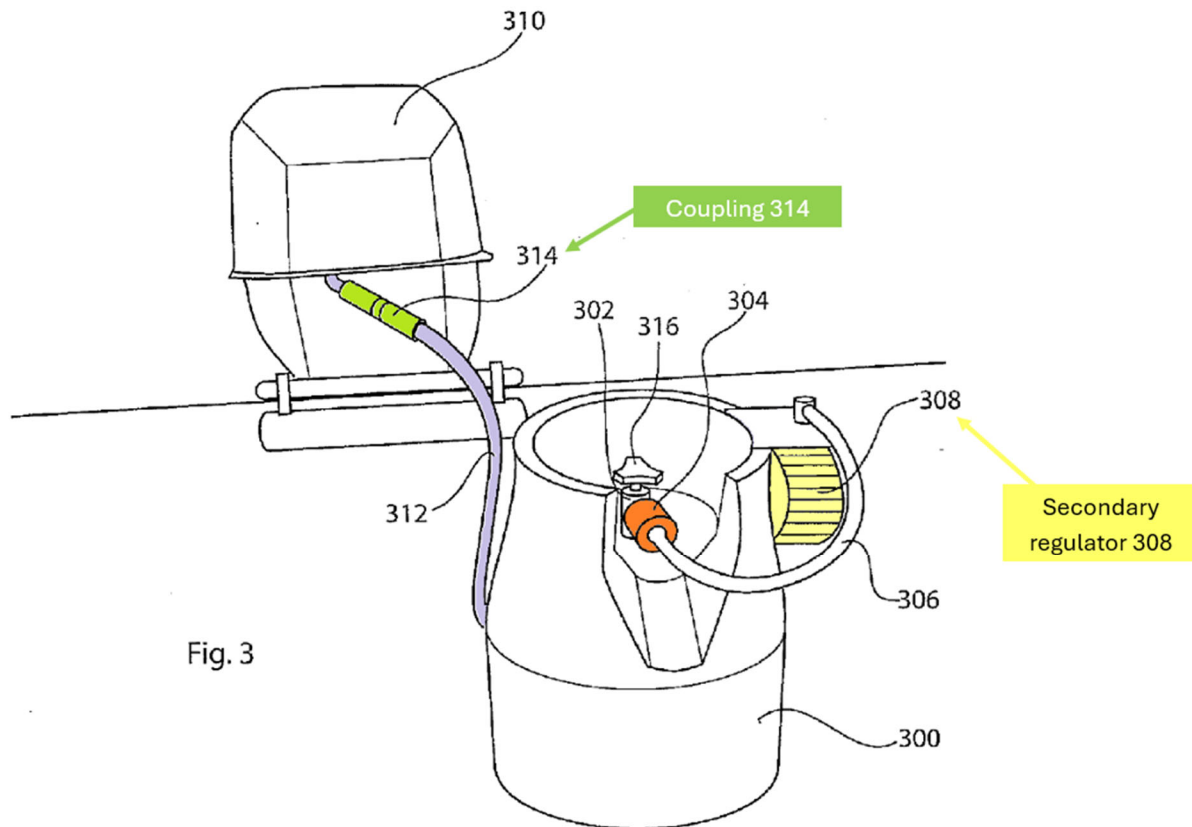
Chaudhari discloses this element. *Supra* §VII.A.1.e. Because primary regulator 3 is connected to the service valve of the LPG cylinder using a tube, it is "connectable" to the service valve in that it is not permanently mounted to the service valve. *Supra* §VII.A.1.e; EX1003, ¶309.

Alternatively, it would have been obvious to use Parlature's Figure 3 off-board configuration with Chaudhari's generator. *Supra* §VII.C.1. Parlature discloses a primary pressure regulator that can be connected to a LPG tank using a hose or connector 302, which means it is "connectable" to the service valve in that it is not permanently affixed to the service valve. EX1010, ¶¶[0016], [0020], Figs. 1 & 3; EX1003, ¶310.

g. Element [20.6]

Chaudhari discloses this element. *Supra* §VII.A.1.f.

Using Parlatore's Figure 3 configuration and a quick-connect as coupling 314, Chaudhari's second stage regulator 5 would be "connectable" with the gaseous fuel valve via the quick-connect:



EX1010, Fig. 3; EX1003, ¶313.

4. Claim 21

Chaudhari's fuel regulator system and LPG cylinder are located off-board the generator and thus independent and disconnected from the generator. *Supra* §VII.A.1.d; EX1003, ¶315.

Alternatively, using Parlatore's Figure 3 off-board configuration with Chaudhari's generator, the LPG tank would be independent and disconnected from the generator. EX1010, Fig. 3; EX1003, ¶316.

5. Claim 22

Chaudhari's fuel regulator system is not mounted or fixed to the generator, and thus is disconnected from the generator. *Supra* §VII.A.1.d; EX1008, 4-5; EX1003, ¶318.

Alternatively, using Parlatore's Figure 3 off-board configuration with Chaudhari's generator (*supra* §VII.C.1), the fuel regulator system would be "disconnected" from the dual-fuel generator in that it is not permanently affixed to the generator (EX1010, Fig. 3; EX1003, ¶319).

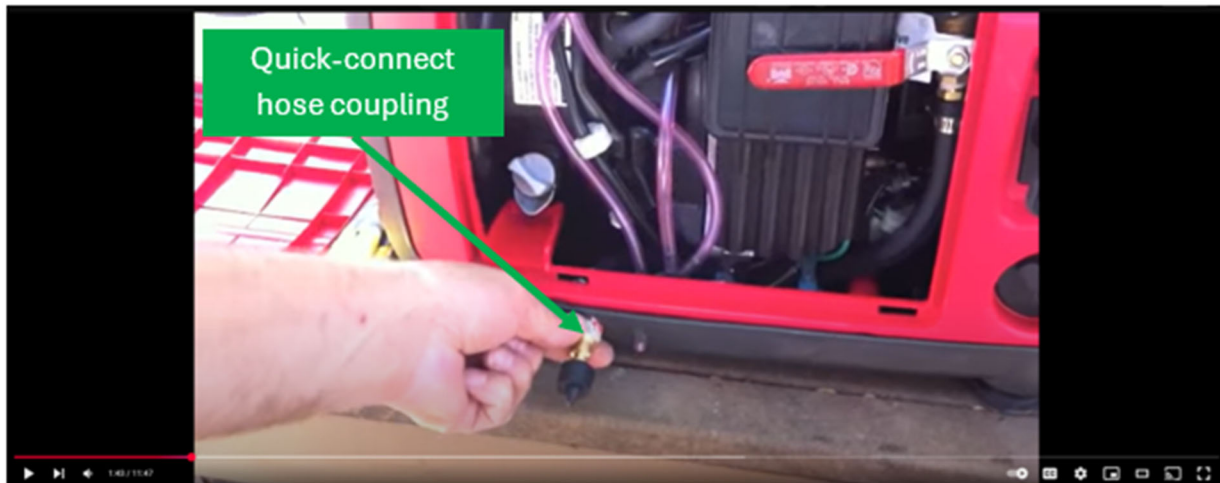
6. Claim 23

Chaudhari's primary regulator 3 is coupled to LPG cylinder 1 through high-pressure tube 2 (*supra* §VII.A.1.e) and thus is "disconnected" from LPG cylinder 1 in that it is not permanently affixed to the cylinder. EX1003, ¶321; EX1008, 7, 13.

Alternatively, using Parlatore's Figure 3 off-board configuration with Chaudhari's generator (*supra* §VII.C.1), Parlatore discloses the primary pressure regulator can be connected to a LPG tank using a hose or connector 302, and thus is "disconnected" from and not permanently affixed to the tank. EX1010, ¶¶[0016], [0020], Figs. 1 & 3; EX1003, ¶322.

7. Claim 24

It would have been obvious to mount the quick-connect (and its integral valve) to an external surface of the generator based on the Tri-Fuel Video. EX1003, ¶324. The Tri-Fuel Video discloses a quick-connect mounted to the external service of the generator:



EX1007, 1:43-1:50.

a. Motivation/Expectation of Success

A POSA would have been motivated to mount the quick-connect to the external surface of the generator to have the quick-connect serve the dual purpose as an easy attachment/detachment mechanism for the LPG hose and to provide a sturdy attachment for the LPG hose to connect to the generator. EX1003, ¶326.

A POSA would have reasonably expected success based on the success of the individual in the Tri-Fuel Video, who appears to have made this modification with tools at his home. *Id.*, ¶327.

8. Claim 25

a. Element [25.1]

Chaudhari in combination with Hallberg discloses this element. *Supra*
§VII.A.3.a.

b. Element [25.2]

Chaudhari in combination with Hallberg discloses this element. *Supra*
§VII.A.3.b.

9. Claim 26

a. Element [26.1]

Chaudhari in combination with Hallberg discloses this element. *Supra*
§VII.A.4.a.

b. Element [26.2]

Chaudhari in combination with Hallberg discloses this element. *Supra*
§VII.A.4.b.

10. Claim 27

Chaudhari in combination with Hallberg discloses this element. *Supra*
§VII.A.5.

11. Claim 29

Using a quick-connect with an integral valve to connect a LPG tank to
Chaudhari's generator as Parlatore's coupling 314 would have this element. *Supra*
§§VII.D.1, VII.D.3.c

12. Claim 30

This element is disclosed. *Supra* §VII.C.1.

13. Claim 31

This element is disclosed and was obvious. *Supra* §VII.C.2.

14. Claim 32

This element is disclosed and was obvious. *Supra* §VII.C.3.

15. Claim 33

This element is disclosed. *Supra* §VII.C.4.

16. Claim 39

This element is disclosed. *Supra* §VII.D.1.

17. Claim 45

This element is disclosed. *Supra* §VII.D.3.c.

18. Claim 46

This element is disclosed. *Supra* §VII.F.3.

19. Claim 49

This element is disclosed. *Supra* §VII.D.1.

E. Ground 5: Claims 1-6, 8-14, 16-19, 34-38, 40-44, 47-48, and 50-52 are obvious over DuroMax in view of Parlatore and Elsdon

These claims are obvious under §103, as detailed below and in the declaration of Dr. Morse. EX1003, ¶¶360-520.

1. Claim 1

a. Element [1.0]

DuroMax discloses a dual-fuel generator that operates on either LPG or gasoline and a system for delivery of LPG and gasoline to the generator. *See generally* EX1004; *infra* §VII.E.1.b.

b. Element [1.1]

DuroMax discloses gasoline is supplied from the tank through a liquid fuel line. EX1004, 9, 20-21, 30-31 (parts diagram/list depicting liquid fuel line as “PartNo. 137, Outlet Pipe”).

Step 2 - Add Gasoline

 **WARNING: Gasoline and gas fumes are highly flammable.**

- **Do not fill tank near an open flame.**
- **Do not overfill. Always check for fuel spills.**

To ensure that the generator runs smoothly use only FRESH, UNLEADED GAS WITH AN OCTANE RATING OF 87 OR HIGHER.

To add gasoline:

1. Make sure the generator is on a level surface.
2. Unscrew gas cap and set aside (NOTE: the gas cap may be tight and hard to unscrew).
3. Slowly add unleaded gasoline to the fuel tank. Be careful not to overfill. Please refer to the chart in *figure 4* to find the gas capacity of your generator model. The fuel gauge on the top of the gas tank indicates how much gasoline is in the generator gas tank.
NOTE: Gas can expand. Do not fill the gas tank to the very top.
4. Replace fuel cap and wipe up any spilled gasoline with a dry cloth.

EX1004, 9.

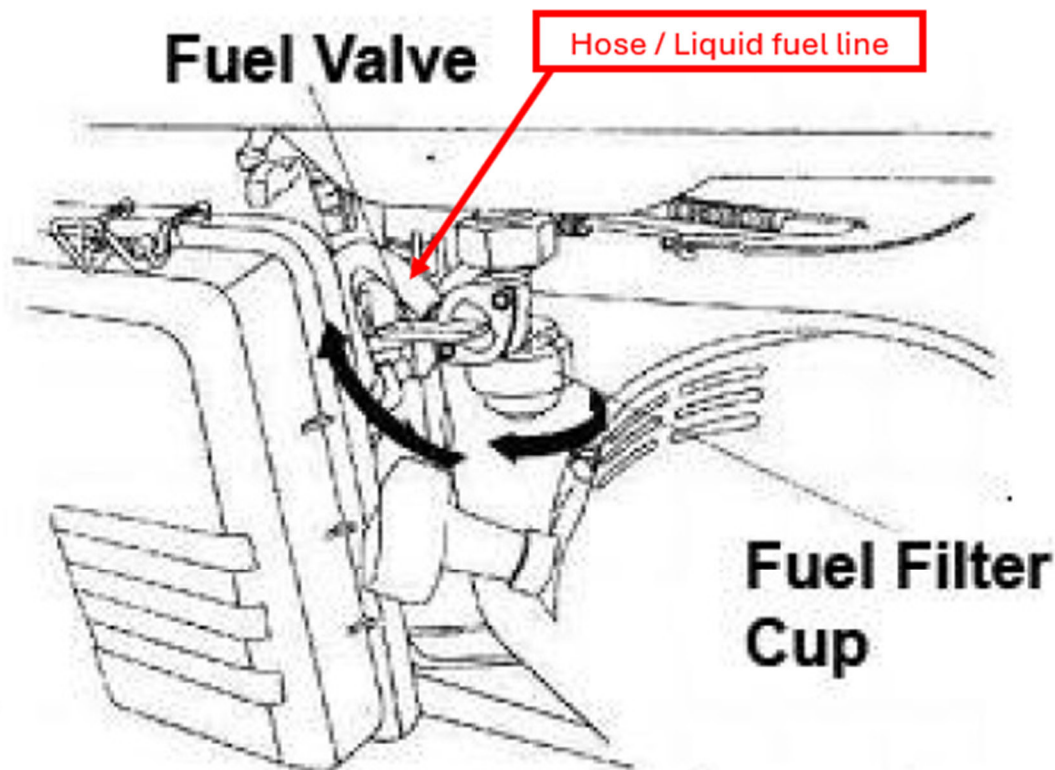


Figure 19 –Removing the Fuel Filter Cup

EX1004, 20.

DuroMax discloses LPG is supplied from a LPG tank through a gaseous fuel line. EX1004, 1 (cover showing LPG tank and hose), 12 (LPG hose), 30-31 (“Gas tube” 161 and “Intake tube, carburetor” 162).

The LPG tank is inherently pressurized because: (1) LPG tanks are pressurized, (2) DuroMax refers to the LPG as “liquid propane gas supply” and propane is only in liquid form under pressure, (3) the LPG tube is referred to as “Pressure Tube,” and (4) DuroMax discloses a pressure release valve before

starting the engine to release excess pressure and the use of pressure regulators to reduce the pressure of LPG from the tank. EX1004, 1, 12, 30-31; EX1003, ¶366.

c. Element [1.2]

DuroMax discloses a carburetor. EX1004, 28-29 (parts diagram/list referring to carburetor). A POSA would have recognized that the carburetor functions to mix air and fuel, as its primary purpose in internal combustion engines is to atomize liquid fuel and blend it with incoming air to create a combustible mixture. EX1003, ¶368. Further, by design, the carburetor connects the liquid fuel line to the engine's intake, receiving fuel from the line through its inlet and delivering the air-fuel mixture to the intake. *Id.*

d. Element [1.3]

DuroMax's generator had one pressure regulator off-board (attached to the off-board hose, shown in Figure C) and one pressure regulator on-board (attached to the generator, indicated in step 4 and Figure B):

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

1. Make sure no electrical devices are connected to the generator.
2. Check that the generator is properly grounded (see page 13, "Ground the Generator").
3. Turn the gasoline fuel valve to the "OFF" position (see figure 6).
4. Connect the propane gas hose to the regulator (see figure B).
5. Connect the regulator to the liquid propane gas supply and then turn on the liquid propane gas supply, making sure there are no leaks (see figure C).
6. Open the clasp connected to the Pressure Release Valve (see figure C).
7. Press the button on Pressure Release Valve two to three times before starting the engine. (see figure D)
8. When starting the engine:
 - a. If the engine is warm (The unit was run recently) start with the choke half open.
 - i. Wait another 30 seconds and then move the choke lever all the way to the "OPEN" position.
 - b. If the engine is cold (The unit has not been run for half an hour or more) start with the choke open. (see figure E & F).
9. Pull on the recoil starter handle slowly until a slight resistance is felt (see figure 8). Then pull quickly to start the engine. Return cord gently into the machine. Never allow the cord to snap back.
10. Allow the generator to run for several minutes before attempting to connect any electrical devices.

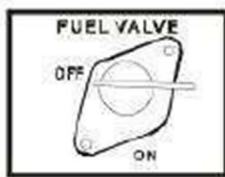


Figure A - Fuel Valve in the "OFF" position



Figure C-Connect Valve



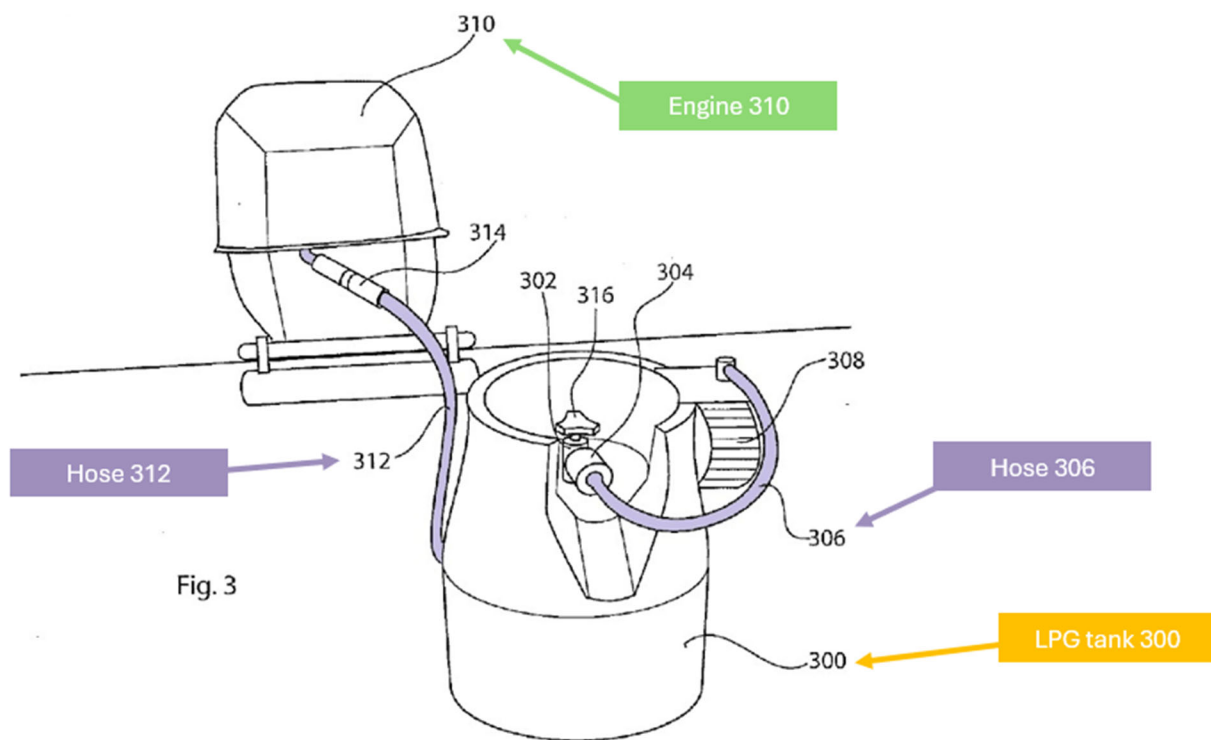
Figure B - Connect the Hose

EX1004, 12.

A POSA would have found it obvious to use an off-board regulator system with both regulators off-board, such as Parlatore's Figure 3 off-board configuration, with DuroMax's generator. EX1003, ¶371.

Parlatore discloses a fuel regulator system with a primary regulator (first stage) and a secondary regulator (second stage): “The fuel delivery system may include 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.” EX1010, ¶[0005]; *see also* EX1010, ¶¶[0006], [0016]-[0021], Figs. 1-3.

Parlatore discloses the fuel regulator system may be “off-board” (i.e., “separate” from) the engine:



EX1010, Fig. 3; ¶[0020].

Parlatore discloses the embodiment of Figure 2 with a generator and discloses the embodiment of Figure 3 for “any situation where more fuel may be

desired.” EX1010, ¶¶[0019], [0024]. Parlatore also discloses its “LPG applications may be used on any desired form of engine.” EX1010, ¶[0025]; *see also* EX1010 ¶[0012] (“the term ‘embodiments of the invention’ does not require that all embodiments of the invention include the discussed feature, advantage or mode of operation”), ¶[0026] (“the invention should not be construed as being limited to the particular embodiments discussed above”); ¶[0027] (“the above-described embodiments should be regarded as illustrative rather than restrictive” and “variations to those embodiments can be made by those skilled in the art”).

Therefore, Parlatore teaches the embodiment of Figure 3 (where the fuel regulator system is “off-board” the engine) for use with any engine (including in the context of a generator, such as the generators mentioned in paragraph [0019]), such that the fuel regulator system would be “off-board” a generator. EX1010, ¶¶[0019], [0012], [0024]-[0027]; EX1003, ¶375.

It would have been obvious to use Parlatore’s off-board fuel regulator system with the DuroMax dual-fuel generator. EX1003, ¶376.

i. Motivation/Expectation of Success

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. EX1003, ¶377. 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 Parlatore because Parlatore discloses the use a regulator system with “any desired form of engine” and specifically suggests the use of its regulator system with generators. EX1010, ¶¶[0019] & [0025]; *see also* EX1010, ¶[0024] (suggesting off-board configuration “where more fuel may be desired”); EX1003, ¶378.

Parlatore thus shows that a POSA would have reasonably expected success using an off-board fuel regulator system. EX1010, ¶¶[0019]-[0021], [0024]-[0025], Fig. 3; EX1003, ¶379.

e. Element [1.4]

Parlatore discloses the gaseous fuel (LPG) supplied from the pressurized fuel source (LPG tank) is regulated down to a reduced pressure (through the primary regulator) in the first stage:

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. For example, the primary regulator 106

may be such that it reduces pressure of the propane from a high pressure state while the propane is in the LPG tank 102, which may be approximately 180-250 psi, to a sub-atmospheric pressure, approximately 10 psi.

EX1010, ¶[0016] (emphasis added); *see also* EX1010, ¶¶[0005]-[0006], [0017]-[0021], Figs. 1-3.

Parlatore discloses a connector 302 for coupling the primary pressure regulator to a service valve (shut off valve 316) of a propane tank. EX1010, ¶¶[0021], [0023], Fig. 3.

f. Element [1.5]

Parlatore discloses regulating the reduced pressure gaseous fuel that has exited the primary regulator) in the second stage down to a desired pressure in the second stage (i.e., through the secondary regulator) for delivery through the gaseous fuel line (e.g., hose 112) to operate the generator. EX1010, ¶¶[0005]-[0006], [0016]-[0021], Figs. 1-3; EX1003, ¶384. Parlatore discloses the LPG regulated down to the second stage is used to operate the generator because it flows from the secondary regulator to the carburetor through a hose (such as hose 112). EX1010, ¶¶[0017]-[0018], [0020], Fig. 1, 3; EX1003, ¶384.

g. Element [1.6]

DuroMax discloses a mechanical fuel valve for gasoline coupled to the internal combustion engine:

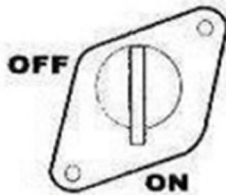


Figure 6 - fuel valve in the "on" position

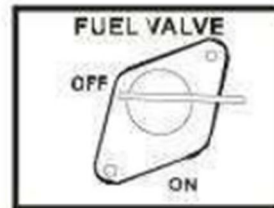
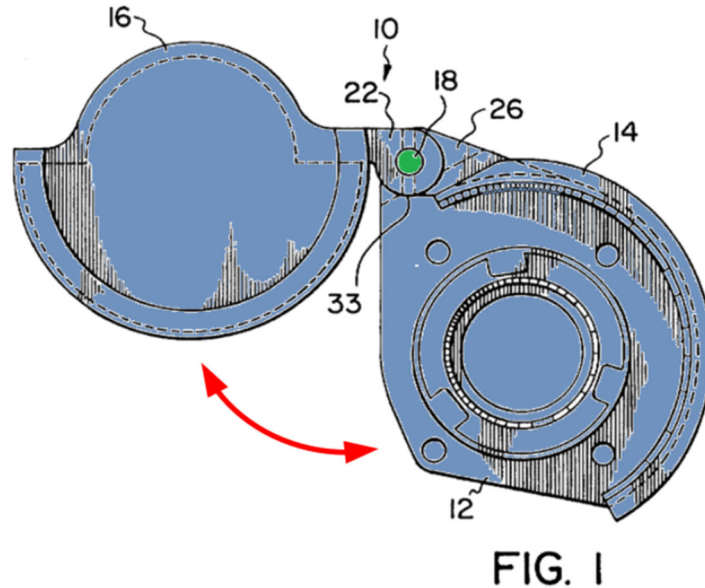


Figure A - Fuel Valve in the "OFF" position

EX1004, 11-12.

Elsdon discloses a fuel conduit coupler 12 shield 14 and cap 16 that, when closed, prevents connection of a fuel source. EX1005, 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.

EX1005, 3:3-14, 5:1-10.



EX1005, Fig. 1.

It would have been obvious to a POSA to combine the Elsdon fuel conduit coupler cap with DuroMax's gasoline fuel valve 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 of the DuroMax generator (as disclosed by Elsdon). EX1003, ¶388. 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 '970 Patent. *Id.*

i. Motivation to Combine

A POSA would have been motivated to implement the fuel conduit coupler cap assembly of Elsdon to selectively cover and uncover the LPG fuel conduit coupler of DuroMax. *Id.*, ¶389. 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 operating on gasoline. *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. *Id.*, ¶390. A POSA would have understood such an arrangement to prevent simultaneous use of LPG and gasoline, which was a known problem to avoid with generators such as DuroMax. EX1004, 11; EX1001, 1:56-67; EX1003, ¶390.

A POSA would have understood 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. EX1003, ¶391. For example, DuroMax provides the following warning label:

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

EX1004, 11.

Elsdon discloses 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. EX1005, 1:23-40.

Elsdon discloses that its cap and shield may be utilized in such sequenced interconnected valve and coupler arrangements. EX1005, 4:44-53.

A POSA would have been motivated to make this combination to ensure the inlet is automatically shielded when not connected, to prevent debris from entering the LPG fuel inlet of the DuroMax generator. EX1003, ¶393. Elsdon specifically teaches this motivation: “It is an object of the present invention to provide a cap and shield assembly to protect a fluid conduit coupler from debris.” EX1005, 2:7-9.

ii. Expectation of Success

A POSA would have reasonably expected success in implementing the fuel conduit coupler cap of Elsdon onto the LPG fuel conduit coupler of DuroMax. EX1003, ¶394. Elsdon emphasizes that its cap assembly may be “retrofit” to cover existing fuel couplers on “construction equipment” such as a generator. EX1005, 2:10-12, 2:27-31, 5:11-14. Elsdon uses a simple connection arrangement, in which cap 16 rotates around the axis of the shaft 18:

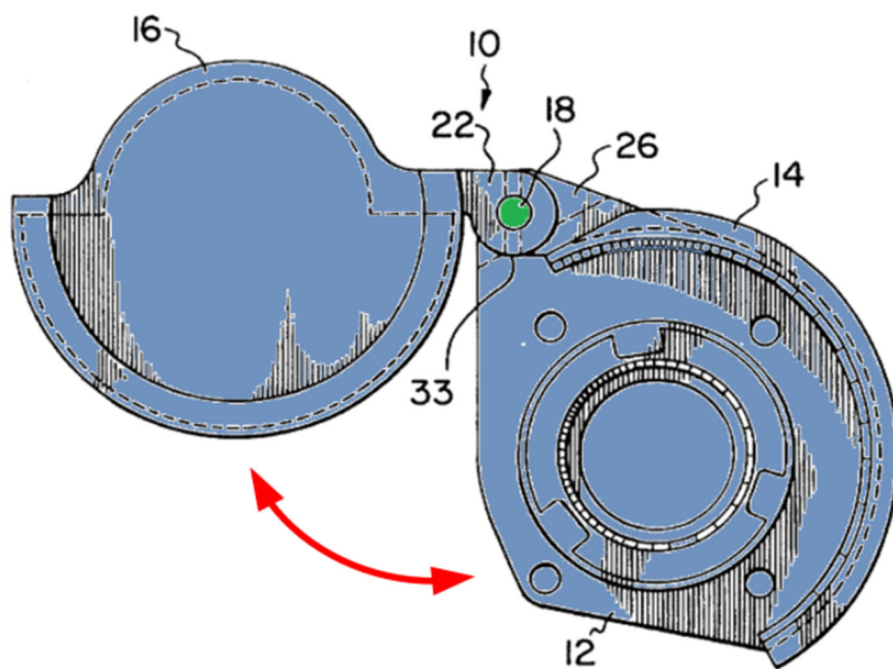


FIG. 1

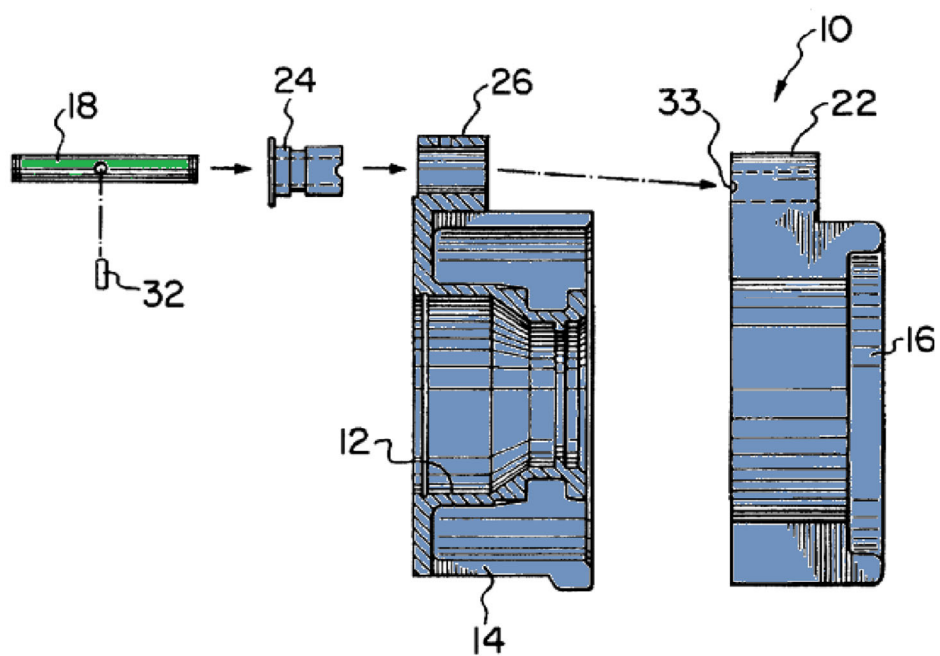


FIG. 3

EX1005, Figs. 1, 3.

A POSA would have understood that the fuel valve of DuroMax is a simple mechanical fuel valve using a valve handle that rotates a shaft connected to a stop inside of the valve body for preventing fuel flow. EX1004, 11-12; EX1003, ¶395.

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. EX1003, ¶396.

A POSA would have 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. EX1003, ¶397; *see also* EX1013, 15:39-16:20 (discussing how the position of the LPG regulator, and therefore the inlet connector on a portable generator can be easily moved to different locations). 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 could rotate to permit access to the LPG fuel conduit coupler when the DuroMax fuel valve is closed. EX1003, ¶397.

2. Claim 2

The DuroMax carburetor connects the gaseous fuel line to the intake. EX1004, 28-29 (Part No. 18 is “LPG Carburetor ASSY”), 30-31 (Part No. 161

“Gas tub” connected to Part No. 86 “Pressure Release Valve,” which is connected to Part No. 162 “Intake tube, carburetor”); EX1003, ¶399.

3. Claim 3

a. Element [3.1]

It would have been obvious to connect 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. *Supra* §VII.E.1.g; EX1003, ¶402.

b. Element [3.2]

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). EX1004, 11-12; EX1003, ¶404. It would have been obvious to connect the valve handle and shaft of the DuroMax fuel valve to cap 16 of Elsdon to prevent the simultaneous

flow of gasoline and LPG fuel to the dual-fuel engine. *Supra* §VII.E.1.g; EX1003, ¶404. 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 communication between the LPG fuel source and the dual-fuel engine) and to uncover the LPG fuel conduit coupler (communicating the second fuel source to the dual-fuel engine) when the mechanical fuel valve is in the closed (second) position. *Supra* §VII.A.1.g; EX1003, ¶404.

4. Claim 4

a. Element [4.1]

DuroMax in combination with Elsdon discloses a mechanical fuel valve that selectively controls fuel flow to the engine from the gasoline tank through the liquid fuel line by opening and closing the liquid fuel line. *Supra* §VII.E.1.g; EX1003, ¶407.

b. Element [4.2]

Duromax in combination with Elsdon discloses a fuel lockout apparatus coupled to the mechanical fuel valve. *Supra* §VII.E.3.a. The fuel lockout apparatus prevents the LPG tank from coupling to the generator when communicating (opening) the gasoline line to the generator, and permits the LPG tank to couple to the generator when interrupting (closing) the gasoline line to the generator. *Supra* §VII.E.3.b; EX1003, ¶409.

5. Claim 5

When DuroMax's generator is running on LPG, the LPG tank connector couples to a LPG hose of an external LPG tank. *Supra* §VII.E.1.b. When the LPG hose is coupled to the LPG tank connector, the flange of Elsdon would be physically unable to rotate to a position that blocks the LPG tank connector of DuroMax due to the presence of the LPG hose. EX1003, ¶411. Thus, because the flange would be unable to rotate to a position blocking the LPG tank connector, it would prevent the mechanical fuel valve from opening the liquid fuel line while the dual-fuel generator receives fuel from the LPG tank. *Id.*

6. Claim 6

Elsdon's cap 16 would actuate with the DuroMax mechanical fuel valve to cover an inlet of the LPG line while the mechanical fuel valve opens the gasoline line. *Supra* §VII.E.1.g; EX1003, ¶413. Elsdon's cap 16 would actuate with the DuroMax mechanical fuel valve to uncover an inlet of the LPG line when the mechanical fuel valve closes the gasoline line. *Supra* §VII.E.1.g; EX1003, ¶413.

7. Claim 8

Parlatore's Figure 3 configuration discloses the secondary pressure regulator mounted on the LPG tank via a mounting device. *Supra* §VII.C.1.

8. Claim 9

Parlatore discloses this element and it was obvious. *Supra* §VII.C.2.

9. Claim 10

Parlatore discloses this element and it was obvious. *Supra* §VII.C.3.

10. Claim 11

Parlatore discloses this element. *Supra* §VII.C.4. A POSA would have been motivated to use Parlatore's two-stage regulator with the DuroMax generator for the same reasons discussed. *Supra* §VII.C.2; EX1003, ¶421.

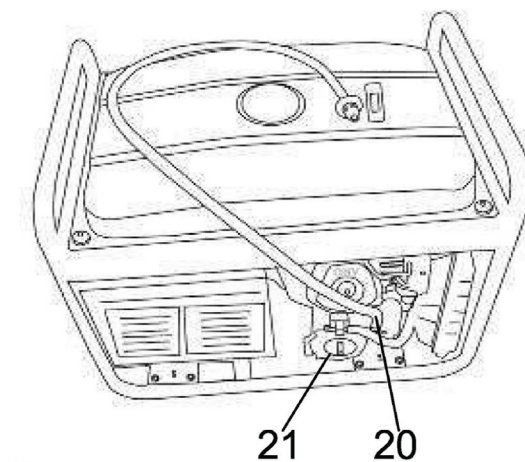
11. Claim 12

a. Element [12.0]

DuroMax discloses this element. *Supra* §VII.E.1.a.

b. Element [12.1]

DuroMax discloses this element. *Supra* §VII.E.1.b. DuroMax's generator contains a housing where the engine is mounted:



EX1004, 7.

DuroMax discloses an alternator. EX1004, 7 (the generator includes AC receptacles), 30-31 (parts diagram/list depicting alternator as “PartNo. 123, Stator & Rotator ASSY”); EX1003, ¶428.

The alternator is mounted to the housing with at least flange bolts 141. EX1004, 1 (showing all the internal components of the generator mounted within the housing, off the ground), 30-31.

It is inherent that the engine drives the alternator, as the drive mechanism is a fundamental and necessary aspect of engine-powered generators. EX1003, ¶430.

c. Element [12.2]

DuroMax in combination with Parlatores discloses this element. *Supra* §VII.E.1.d.

d. Element [12.3]

DuroMax in combination with Parlatores discloses this element. *Supra* §VII.E.1.e.

e. Element [12.4]

DuroMax in combination with Parlatores discloses this element. *Supra* §VII.E.1.f.

f. Element [12.5]

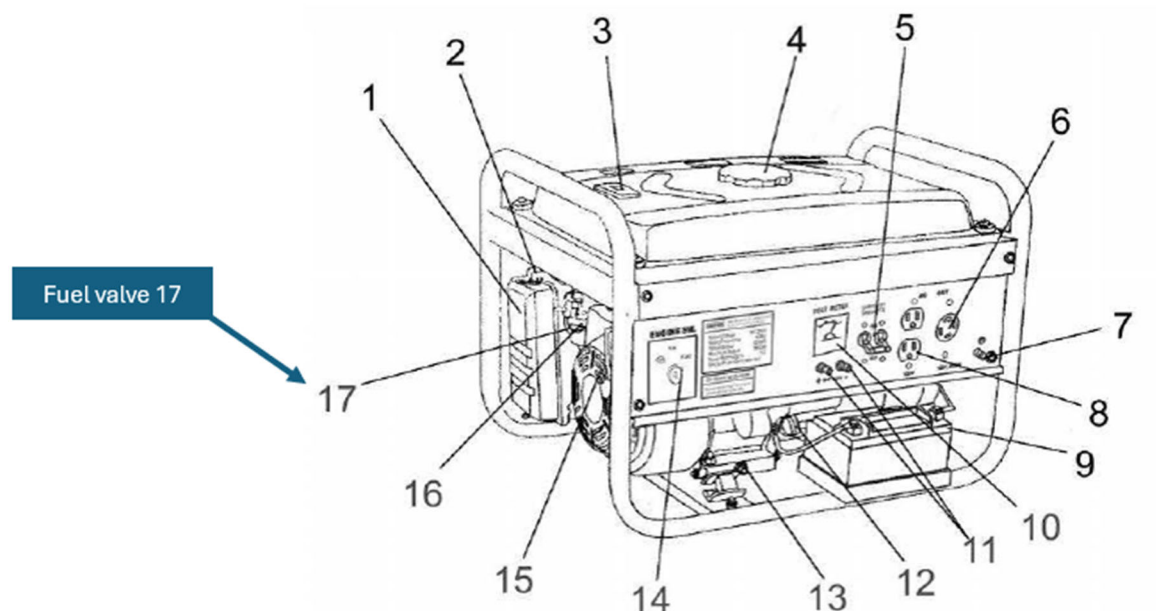
DuroMax in combination with Elsdon discloses this element. *Supra* §VII.E.1.g.

g. Element [12.6]

DuroMax in combination with Parlatore discloses this element. *Supra* §VII.E.1.d.

12. Claim 13

DuroMax's fuel valve is mounted within its housing:



EX1004, 7, 8.

It would have been obvious to a POSA to similarly locate DuroMax's fuel valve combined with Elsdon's fuel conduit coupler within DuroMax's housing to prevent the combined component from being damaged. EX1003, ¶443. A POSA

would have reasonably expected success based on the configuration of the DuroMax configuration and housing. *Id.*

13. Claim 14

a. Element [14.1]

DuroMax in combination with Parlatore discloses this element. *Supra* §§VII.E.1.e, VII.E.11.d.

b. Element [14.2]

DuroMax in combination with Parlatore discloses this element. *Supra* §§VII.E.1.f, VII.E.11.e.

14. Claim 16

Parlatore discloses this element. *Supra* §VII.C.1.

15. Claim 17

Parlatore discloses this element and it was obvious. *Supra* §VII.C.3.

16. Claim 18

Parlatore discloses this element. *Supra* §VII.C.4.

17. Claim 19

Parlatore discloses this element and it was obvious. *Supra* §VII.C.2.

18. Claim 34

a. Element [34.0]

DuroMax discloses this element. *Supra* §VII.E.1.a.

b. Element [34.1]

DuroMax discloses this element. *Supra* §VII.E.1.b.

c. Element [34.2]

DuroMax in combination with Parlatores discloses this element. *Supra* §VII.E.1.d.

d. Element [34.3]

DuroMax in combination with Parlatores discloses this element. *Supra* §VII.E.1.e.

e. Element [34.4]

DuroMax in combination with Parlatores discloses this element. *Supra* §VII.E.1.f.

f. Element [34.5]

DuroMax in combination with Elsdon discloses this element. *Supra* §VII.E.1.g.

g. Element [34.6]

DuroMax in combination with Elsdon discloses a mechanical fuel valve that would allow gaseous fuel to flow to the dual-fuel generator when the DuroMax fuel valve is closed, thus outputting gaseous fuel to the generator in the same way as the mechanical fuel valve of the '970 Patent. *Supra* §VII.E.1.g; EX1003, ¶470.

19. Claim 35

a. Element [35.1]

DuroMax in combination with Elsdon discloses this element. *Supra*
§VII.E.3.a.

b. Element [35.2]

DuroMax in combination with Elsdon discloses this element. *Supra*
§VII.E.3.b.

20. Claim 36

a. Element [36.1]

DuroMax in combination with Elsdon discloses this element. *Supra*
§VII.E.4.a.

b. Element [36.2]

DuroMax in combination with Elsdon discloses this element. *Supra*
§VII.E.4.b.

21. Claim 37

DuroMax in combination with Elsdon discloses this element. *Supra*
§VII.E.5.

22. Claim 38

DuroMax in combination with Elsdon discloses this element. *Supra*
§VII.E.6.

23. Claim 40

Parlatore discloses this element. *Supra* §§VII.C.1, VII.E.7.

24. Claim 41

Parlatore discloses this element and it was obvious. *Supra* §VII.C.2.

25. Claim 42

Parlatore discloses this element and it was obvious. *Supra* §VII.C.3.

26. Claim 43

Parlatore discloses this element. *Supra* §VII.C.4.

27. Claim 44

a. Element [44.0]

DuroMax discloses this element. *Supra* §VII.E.1.a.

b. Element [44.1]

DuroMax discloses this element. *Supra* §VII.E.11.b.

c. Element [44.2]

DuroMax discloses this element. *Supra* §VII.E.1.b. It is inherent that DuroMax's engine drives its alternator to generate electricity for the generator, because there is no other power source to generate electricity. EX1003, ¶498.

d. Element [44.3]

DuroMax discloses this element. *Supra* §VII.E.1.b-VII.E.1.c.

e. Element [44.4]

DuroMax discloses this element. *Supra* §§VII.E.1.b, VII.E.2.

f. Element [44.5]

DuroMax in combination with Elsdon discloses this element. *Supra* §VII.E.1.g.

g. Element [44.6]

DuroMax in combination with Parlato discloses this element. *Supra* §VII.E.1.d.

28. Claim 47

The mechanical fuel valve of the DuroMax-Elsdon combination would be upstream from the liquid fuel line and the gaseous fuel line to selectively control fuel flow into the liquid fuel line from the liquid fuel source and the gaseous fuel line from the pressurized fuel source. *Supra* §VII.E.1.g; EX1003, ¶508.

29. Claim 48

The DuroMax generator has a liquid fuel valve coupled to the liquid fuel line. *Supra* §VII.E.1.g.

The DuroMax manual also discloses a gaseous fuel valve coupled to the gaseous fuel line (the service valve on the LPG tank). EX1004, 1.

30. Claim 50

a. Element [50.1]

DuroMax in combination with Elsdon discloses this element. *Supra* §§VII.E.1.g, VII.E.4.a.

b. Element [50.2]

DuroMax in combination with Elsdon discloses this element. *Supra* §VII.E.4.b.

31. Claim 51

DuroMax in combination with Elsdon discloses this element. *Supra* §VII.E.5.

32. Claim 52

DuroMax in combination with Elsdon discloses this element. *Supra* §VII.E.6.

F. Ground 6: Claims 7, 15, 20-33, 39, 45-46, and 49 are obvious over DuroMax in view of Parlatore, LP-Gas Handbook, Sturgis, Elsdon, and Tri-Fuel Video

These claims are obvious under §103, as detailed below and in the declaration of Dr. Morse. EX1003, ¶¶521-586.

1. Claim 7

It would have been obvious to a POSA to use a quick-connect at the end of the Parlatore hose (e.g., as coupling 314) in view of the teachings of LP-Gas Handbook. *Supra* §VII.D.1; EX1003, ¶524.

As such, a first end would be coupled to the outlet of the secondary regulator 308 and a second end would be coupled to an inlet of the gaseous fuel line, such as Part No. 161 “Gas tube” (EX1004, 30-31), of the engine of the DuroMax generator to couple the secondary pressure regulator to the gaseous fuel line. EX1003, ¶525.

2. Claim 15

Using a quick-connect hose coupling to connect a LPG tank to the DuroMax generator would have this element. *Supra* §§VII.D.1, VII.F.1.

3. Claim 20

a. Element [20.0]

DuroMax discloses this element. *Supra* §VII.E.1.a.

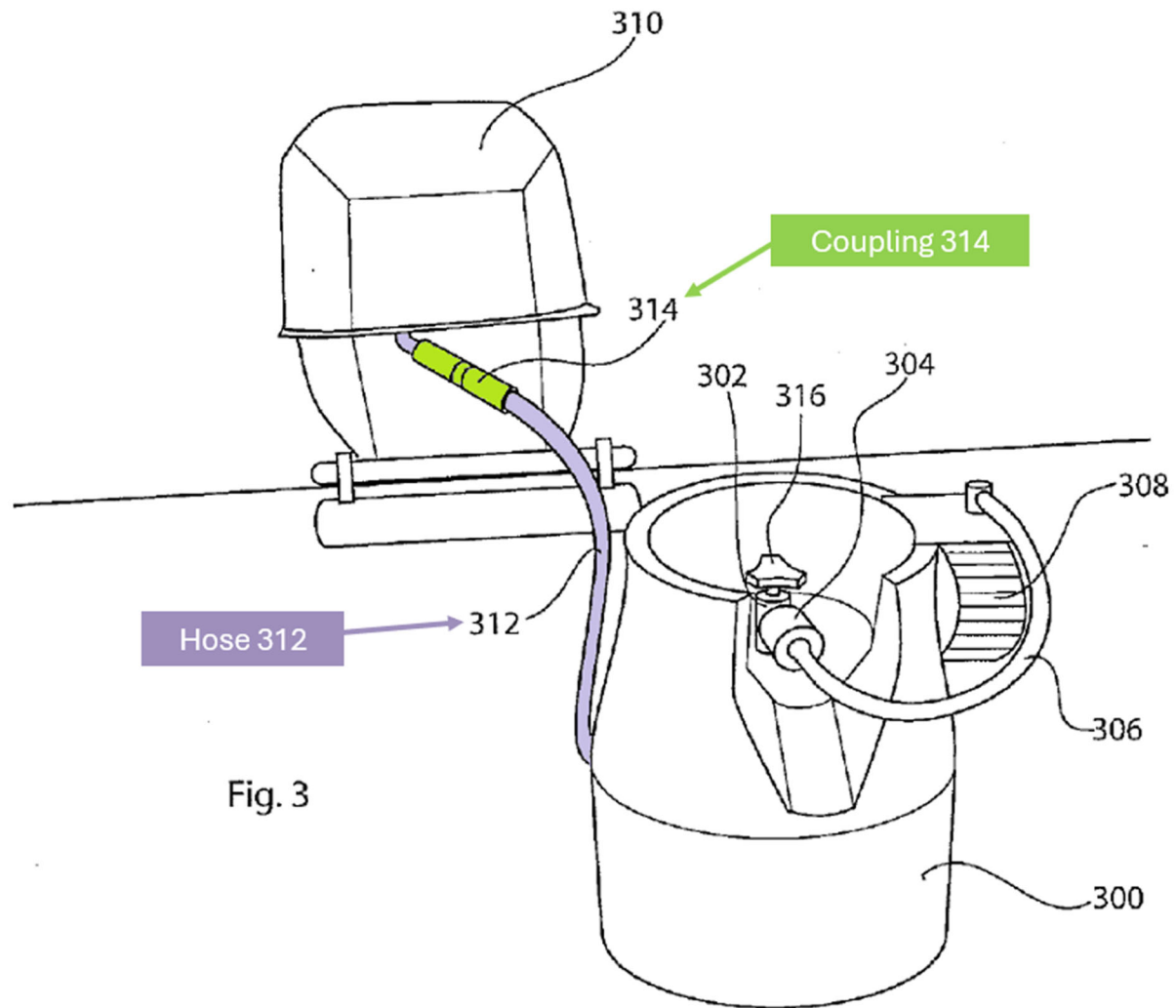
b. Element [20.1]

DuroMax discloses this element. *Supra* §VII.E.1.b.

c. Element [20.2]

It would have been obvious to use a quick-connect hose coupling to connect a LPG tank to DuroMax's generator as Parlatore's coupling 314. *Supra* §VII.F.1.

A quick-connect typically has an integral valve and, therefore, the valve of the quick-connect would be a gaseous fuel valve for purposes of this claim. *Supra* §VII.D.3.c; EX1003, ¶534. When using a quick-connect as Parlatore's coupling 314, the valve of the quick-connect would be coupled to an inlet of the gaseous fuel line to the DuroMax engine and would be "connectable" to an LPG tank:



EX1010, Fig. 3; EX1003, ¶534.

The DuroMax manual also discloses a gaseous fuel valve (the service valve on the LPG tank) coupled to an inlet of the gaseous fuel line and connectable to the LPG tank. EX1004, 1.

d. Element [20.3]

DuroMax in combination with Elsdon discloses this element. *Supra* §VII.E.11.f.

e. Element [20.4]

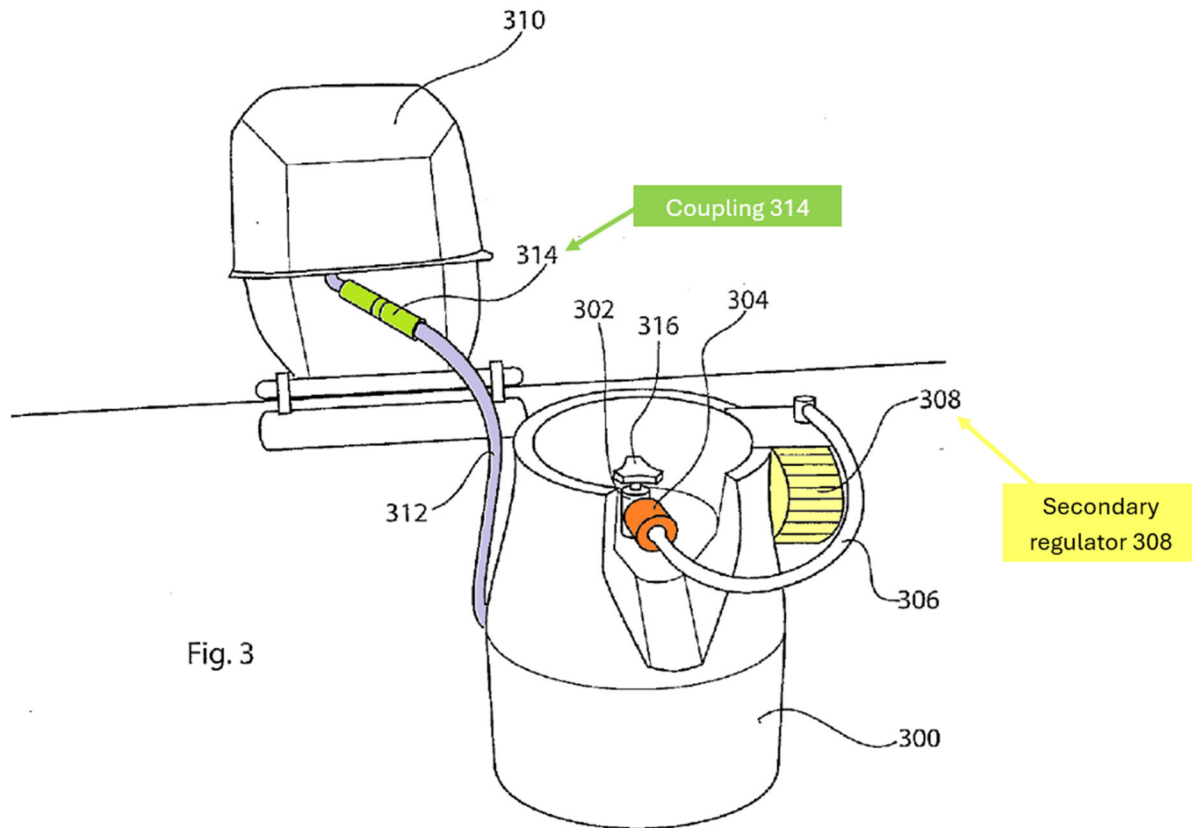
DuroMax in combination with Parlature discloses this element. *Supra* §VII.E.1.d.

f. Element [20.5]

Parlature discloses this element. *Supra* §VII.E.1.e. Parlature discloses primary regulator 106 can be connected to a LPG tank using a hose or connector 302, and thus it is “connectable” to the service valve in that it is not permanently affixed to the service valve. EX1010, ¶¶[0016], [0020], Figs. 1 & 3; EX1003, ¶541.

g. Element [20.6]

Parlature discloses this element. *Supra* §VII.E.1.f. Using a quick-connect with an integral valve as Parlature’s coupling 314, Parlature’s secondary regulator would be “connectable” with the gaseous fuel valve via the quick-connect:



EX1010, Fig. 3; EX1003, ¶543.

4. Claim 21

Using Parlature's Figure 3 configuration, the LPG tank is located off-board the generator and thus independent and disconnected from the generator. *Supra* §VII.E.1.d; EX1003, ¶546.

5. Claim 22

Using Parlature's Figure 3 configuration, the fuel regulator system is off-board and disconnected from the generator. *Supra* §VII.E.1.d; EX1003, ¶548.

6. Claim 23

Parlatore discloses the primary pressure regulator can be connected to the tank using a hose or connector 302 and thus is “disconnected” from tank in that it is not permanently affixed to the tank. EX1010, ¶¶[0016], [0020], Figs. 1 & 3; EX1003, ¶550.

7. Claim 24

It would have been obvious to mount the quick connect (and its integral valve) to an external surface of DuroMax’s dual-fuel generator based on the teachings of the Tri-Fuel Video for the same reasons discussed. *Supra* §VII.D.7; EX1003, ¶553.

8. Claim 25

a. Element [25.1]

DuroMax in combination with Elsdon discloses this element. *Supra* §VII.E.3.a.

b. Element [25.2]

DuroMax in combination with Elsdon discloses this element. *Supra* §VII.E.3.b.

9. Claim 26

a. Element [26.1]

DuroMax in combination with Elsdon discloses this element. *Supra* §VII.E.4.a.

b. Element [26.2]

DuroMax in combination with Elsdon discloses this element. *Supra* §VII.E.4.b.

10. Claim 27

DuroMax in combination with Elsdon discloses this element. *Supra* §VII.E.5.

11. Claim 28

DuroMax in combination with Elsdon discloses this element. *Supra* §VII.E.6.

12. Claim 29

Using a quick-connect with an integral valve to connect a LPG tank to DuroMax's generator as Parlatore's coupling 314 would have this element. *Supra* §§VII.D.1, VII.D.3.c, VII.F.1, VII.F.3.c. EX1003, ¶569.

13. Claim 30

Parlatore discloses this element. *Supra* §VII.C.1.

14. Claim 31

Parlatore discloses this element and it was obvious. *Supra* §VII.C.2.

15. Claim 32

Parlatore discloses this element and it was obvious. *Supra* §VII.C.3.

16. Claim 33

Parlatore discloses this element. *Supra* §VII.E.10.

17. Claim 39

This element is disclosed. *Supra* §VII.F.1.

18. Claim 45

This element is disclosed. *Supra* §VII.F.3.c

In addition, DuroMax discloses a gaseous fuel valve (the service valve on the LPG tank) coupled to an inlet of the gaseous fuel line to connect the LPG to the gaseous fuel line. EX1004, 1.

19. Claim 46

This element is disclosed. *Supra* §VII.F.7.

20. Claim 49

This element is disclosed. *Supra* §VII.F.1.

G. Ground 7: Claims 1-2, 12-14, 20-21, 34, 44-45, and 48 are obvious over Chaudhari in view of Monros and Jungmann

These claims are obvious under §103, as detailed below and in the declaration of Dr. Morse. EX1003, ¶¶587-679.

1. Claim 1

a. Element [1.0]

Chaudhari discloses this element. *Supra* §VII.A.1.a.

b. Element [1.1]

Chaudhari discloses this element. *Supra* §VII.A.1.b.

c. Element [1.2]

Chaudhari discloses this element. *Supra* §VII.A.1.c.

d. Element [1.3]

Chaudhari discloses this element. *Supra* §VII.A.1.d.

e. Element [1.4]

Chaudhari discloses this element. *Supra* §VII.A.1.e.

f. Element [1.5]

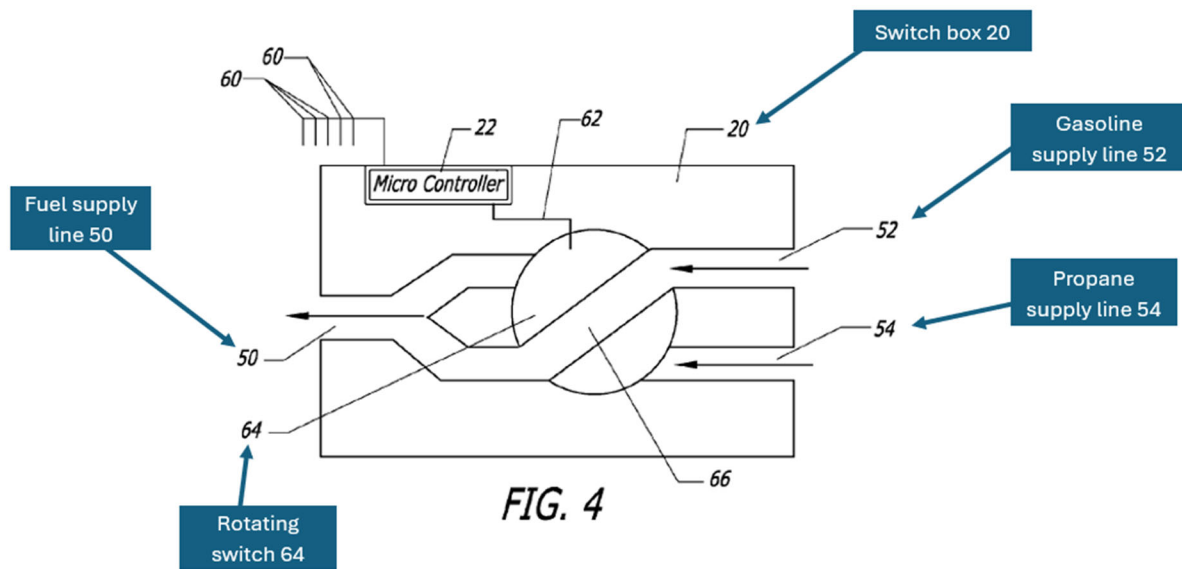
Chaudhari discloses this element. *Supra* §VII.A.1.f.

g. Element [1.6]

Chaudhari discloses selector switch 14 to control solenoid valves 4 and 13 for fuel selection. EX1008, 8-9.

It would have been obvious to add a mechanical version of Monros' switch box 30 to Chaudhari's system, which would be a "mechanical fuel valve."

Monros' switch box 20 selects the flow of gasoline or propane to an engine, actuatable between a first position and second position by rotation. EX1022, ¶¶[0025], [0027].



EX1022, Fig. 4.

Switch box 20 is controlled using microcontroller 22 or selector switch 78.

EX1022, ¶¶[0025], [0030].

It would have been obvious to connect Chaudhari's liquid fuel line and gaseous fuel line to Monros' switch box, to allow only one fuel to flow to Chaudhari's engine at any given time. EX1003, ¶606. It would have been obvious to use a mechanical control to control Monros' switch box, such as a control knob, as was well known in the prior art for actuating valves. *E.g.*, EX1026, 14:61-65; EX1003, ¶606.

i. Motivation/Expectation of Success

A POSA would have been motivated to add Monros' switch box 20 to Chaudhari's system to prevent two types of fuels from flowing to the engine at the

same time, which would result in an improper air/fuel ratio in the engine. EX1003, ¶607. Although Chaudhari discloses solenoid valves and a switch to allow only one type of fuel to flow to the engine at a time, adding Monros' switch box 20 would provide an extra safety measure in the event one of Chaudhari's solenoid valves failed or a failure of the electrical system. *Id.* A POSA would have been motivated to use a mechanical control for Monros' switch box, such as a control knob, to allow switching in the event of a failure of the electrical system. *Id.* This technique was well-known in the art for actuating valves. *E.g.*, EX1026, 14:61-65; EX1003, ¶607.

A POSA would have reasonably expected success because the addition would simply involve connecting Chaudhari's liquid fuel line and gaseous fuel line to Monros' switch box 20, and connecting the fuel supply line of Monros' switch box 20 to Chaudhari's engine via a fuel line. EX1003, ¶608. Employing a mechanical control would have been more basic than Monros' microcontroller. *Id.*

2. Claim 2

Chaudhari discloses this element. *Supra* §VII.A.2.

3. Claim 12

a. Element [12.0]

Chaudhari discloses this element. *Supra* §VII.A.1.a, VII.B.1.a.

b. Element [12.1]

Chaudhari discloses this element in combination with Jungmann. *Supra* §VII.B.1.b.

c. Element [12.2]

Chaudhari discloses this element. *Supra* §§VII.A.1.d, VII.B.1.c.

d. Element [12.3]

Chaudhari discloses this element. *Supra* §§VII.A.1.e, VII.B.1.d.

e. Element [12.4]

Chaudhari discloses this element. *Supra* §§VII.A.1.f, VII.B.1.e.

f. Element [12.5]

This element was obvious. *Supra* §VII.G.1.g.

g. Element [12.6]

Chaudhari discloses this element. *Supra* §§VII.A.1.d, VII.B.1.g.

4. Claim 13

It would have been obvious to a POSA to mount a mechanical version of Monros' switch box 20 on or within the generator housing for the same reasons as mounting Hallberg's mechanical fuel valve. *Supra* §VII.B.2; EX1003, ¶626.

5. Claim 14

a. Element [14.1]

Chaudhari discloses this element. *Supra* §§VII.A.1.e, VII.B.1.d, VII.B.3.a.

b. Element [14.2]

Chaudhari discloses this element. *Supra* §§VII.A.1.f, VII.B.1.e, VII.B.3.b.

6. Claim 20

a. Element [20.0]

Chaudhari discloses this element. *Supra* §§VII.A.1.a, VII.D.3.a.

b. Element [20.1]

Chaudhari discloses this element. *Supra* §§VII.A.1.b, VII.D.3.b.

c. Element [20.2]

Chaudhari discloses LPG solenoid valve 4, which is coupled to an inlet of the gaseous fuel line. EX1008, 7; Fig. 1. Chaudhari discloses LPG solenoid valve 4 is connected to the primary regulator 3, which is connected (and connectable”) to LPG cylinder 1 using a high-pressure tube 2. *Id.*; EX1003, ¶637.

d. Element [20.3]

This element was obvious. *Supra* §VII.G.1.g.

e. Element [20.4]

Chaudhari discloses this element. *Supra* §§VII.A.1.d, VII.D.3.e.

f. Element [20.5]

Chaudhari discloses this element. *Supra* §VII.D.3.f.

g. Element [20.6]

Chaudhari discloses this element. *Supra* §§VII.A.1.f, VII.D.3.g.

7. Claim 21

Chaudhari discloses this element. *Supra* §VII.D.4.

8. Claim 34

a. Element [34.0]

Chaudhari discloses this element. *Supra* §§VII.A.1.a, VII.A.6.a.

b. Element [34.1]

Chaudhari discloses this element. *Supra* §§VII.A.1.b, VII.A.6.b.

c. Element [34.2]

Chaudhari discloses this element. *Supra* §§VII.A.1.d, VII.A.6.c.

d. Element [34.3]

Chaudhari discloses this element. *Supra* §§VII.A.1.e, VII.A.6.d.

e. Element [34.4]

Chaudhari discloses this element. *Supra* §§VII.A.1.f, VII.A.6.e.

f. Element [34.5]

This element was obvious. *Supra* §VII.G.1.g.

g. Element [34.6]

A mechanical version of Monros' switch box 20 (the mechanical fuel valve) would output LPG to Chaudhari's generator during operation thereof on LPG at the desired pressure from Chaudhari's secondary pressure regulator because Monros' switch box 20 would be located downstream of Chaudhari's secondary pressure regulator. EX1003, ¶661.

9. Claim 44

a. Element [44.0]

Chaudhari discloses this element. *Supra* §§VII.A.1.a, VII.B.4.a.

b. Element [44.1]

Chaudhari discloses this element in combination with Jungmann. *Supra* §§VII.B.1.b, VII.B.4.b.

c. Element [44.2]

Chaudhari discloses this element in combination with Jungmann. *Supra* §VII.B.4.c.

d. Element [44.3]

Chaudhari discloses this element. *Supra* §VII.B.4.d.

e. Element [44.4]

Chaudhari discloses this element. *Supra* §VII.B.4.e.

f. Element [44.5]

This element was obvious. *Supra* §VII.G.1.g.

g. Element [44.6]

Chaudhari discloses this element. *Supra* §§VII.A.1.d, VII.B.4.g.

10. Claim 45

Chaudhari discloses this element. *Supra* §VII.G.6.c.

11. Claim 48

A mechanical version of Monros' switch box 20 (the mechanical fuel valve) is a liquid fuel valve and a gaseous fuel valve coupled to both fuel lines. EX1022, ¶¶[0025], [0027]; EX1003, ¶679.

VIII. MANDATORY NOTICES AND FEES

A. Real Parties-In-Interest

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

B. Related Matters

The '970 Patent is or has been involved in several pending litigations.

Patent Owner has asserted the '970 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), 11,530,654 ('654 Patent), and 11,905,895 ('895 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 '970 Patent and related '780 Patent, '398 Patent, '120 Patent, '145 Patent, '985 Patent, '654 Patent, and '895 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 '970 Patent and related '654 Patent, '780 Patent, '398 Patent, '034 Patent, '120 Patent, '985 Patent, '145 Patent, and '895 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 has asserted the '970 Patent and related '780 Patent, '398 Patent, '034 Patent, '120 Patent, '145 Patent, '985 Patent, '654 Patent, and '895 Patent, as well as other non-family member patents 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.

Patent Owner has asserted the '970 Patent and related '780 Patent, '034 Patent, '398 Patent, '120 Patent, '985 Patent, '145 Patent, and '895 Patent, as well as other non-family member patents, in *Champion Power Equipment Inc. v. Westinghouse Elec. Corp. et al.* in the United States District Court of Nevada, Civil Action No. 3:25-cv-00239-ART-CLB.

C. Counsel and Service Information

Pursuant to 37 C.F.R. §42.8(b)(3) and 42.10(a), Petitioner provides the following counsel and service information. Pursuant to 37 C.F.R. §42.10(b), a Power of Attorney for each Petitioner accompanies this Petition.

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Petitioner consents to electronic service directed to the following email address:

HarborFreight-Champion-IPRs@foley.com

D. Payment of Fees

The Office is authorized to charge fees for this Petition to Deposit Account No. 190741. Any additional fees that might be due are also authorized.

IX. CONCLUSION

Trial should be instituted and the Challenged Claims cancelled.

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

1. This Petition complies with the type-volume limitation of 14,000 words, comprising 13,947 words, as counted using the Microsoft Word software that was used to prepare this paper, excluding the parts exempted by 37 C.F.R. § 42.24(a).

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

Date: September 19, 2025

By: /Kimberly K. Dodd/

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that on September 19, 2025, true and correct copies of the foregoing document and supporting materials were served in its entirety on the Patent Owner at the following address of record listed on the USPTO's Patent Center via FedEx Overnight:

26629 - ZIOLKOWSKI PATENT SOLUTIONS GROUP, SC (ZPS)
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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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