IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MWE INVESTMENTS, LLC,

Petitioner

v.

CHAMPION POWER EQUIPMENT, INC.,

Patent Owner.

U.S. Patent No. 10,221,780

DECLARATION OF MAHDI SHAHBAKHTI

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Ex. 1004	DuroMax XP440EH Operator's Manual ("DuroMax")
Ex. 1005	U.S. Patent No. 5,718,265 to Elsdon ("Elsdon")
Ex. 1006	U.S. Patent No. 4,492,207 to Hallberg ("Hallberg")
Ex. 1007	U.S. Patent No. 10,337,399 to Rumao ("Rumao")
Ex. 1008	U.S. Patent No 1,931,698 to Holzapfel ("Holzapfel")
Ex. 1009	*Cambridge Dictionary*, https://dictionary.cambridge.org/dictionary/english/couple (last visited July 8, 2025).
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Ex. 1022	Rowlands S. Benson & N.D. Whitehouse, Internal Combustion Engines (Pergamon Press 1979).
Ex. 1023	K.K. Ramalingam, Handbook of Mechanical Engineering Terms (2d ed. 2009)

DECLARATION OF DR. MADHI SHAHBAKHTI

I declare that all statements made herein on my own knowledge are true and that all statements made on information and belief are believed to be true. These statements were made with the knowledge that willful false statements and the like so made are punishable under Section 1001 of Title 18 of the Unites States Code.

Date: July 22, 2025 By: 
Dr. Mahdi Shahbakhti

I, Dr. Mahdi Shahbakhti declare as follows:

I. BACKGROUND INFORMATION

A. Qualifications and Experience

[0001]. I am a Professor of Mechanical Engineering at the University of Alberta and an Adjunct Professor of Mechanical Engineering at Michigan Technological University. At the University of Alberta, I serve as the Director of the Energy Mechatronics Laboratory. The Energy Mechatronics Laboratory conducts research in a multidisciplinary area of engineering that includes mechanical and electrical systems, design of thermo-fluid systems, and control engineering.

[0002]. I am also a professional engineer (PEng) registered in Alberta (license # 284744). Over the past years, I have led various projects in the area of internal combustion engines and mechanical engineering. I currently lead several design, fabrication, and testing projects in the field of mechanical engineering including, among other things, internal combustion engines and powertrain systems running with conventional and alternative fuels.

[0003]. Before joining Michigan Technological University in 2012, I spent two years as a post-doctoral scholar at the Mechanical Engineering Department at the University of California, Berkeley. My post-doctorate work

focused on model-based design and adaptive control of internal combustion engines and consisted of working closely with the Toyota Motor Company.

[0004]. I earned a Ph.D. in Mechanical Engineering from the University of Alberta in 2009 and a Master of Science degree from KNT University of Technology in 2003. Both my Ph.D. and MSc. dissertations were in the area of internal combustion engines.

[0005]. I have also worked on various aspects of internal combustion engines including design, modeling, benchmarking, experimental studies, calibration, and electronic control unit (ECU) design and implementation since 2000. These include dual fuel, bi-fuel, and single-fuel engines. I have studied engines running with a variety of fuels including but not limited to gasoline, diesel, ethanol, n-heptane, iso-octane, gaseous fuels (natural gas, butane, hydrogen, …), and biofuels.

[0006]. I along with my research group have tested various dual fuel and bi-fuel engines for different applications. These include small (< 0.5 liter) to large scale engines (e.g., 15 liter). Our work has included carburetor, throttle body injection (TBI), port fuel injection (PFI), direct injection (DI) systems, and mixer systems for gaseous fuels in engines. In addition, my work has also covered various engine types including spark ignition, compression ignition, lean burn, low

temperature combustion (HCCI, PPCI, RCCI) engines, and their exhaust aftertreatment systems.

[0007]. I have direct industry experience related to the internal combustion engines. From 2001 to 2004, I worked as a researcher in the automotive industry. During this time, I was involved in the research and development of internal combustion engines and powertrain management systems for gasoline and natural gas bi-fuel vehicles. In the past 13 years, I, along with my research group, have performed a number of research projects sponsored by various companies such as Cummins, Westport, Ford Motor Company, Toyota Motor Corporation, General Motors Corporation, Hyundai, IAV GmbH, Hitachi, and Denso.

[0008]. I have taught undergraduate and graduate courses in mechanical engineering departments in the U.S. and Canada since 2004, taking the role as a primary instructor for more than 26 academic semesters, and a teaching assistant for eight academic semesters. I have regularly taught a graduate course and undergraduate technical elective course on “Internal Combustion Engines and Alternative Fuels”, MECE 541, at the University of Alberta since 2008. Some of the others courses I have taught include Thermodynamics, Fluid Dynamics, Energy Thermal Fluids, Feedback Control Design of Dynamic Systems, Model Predictive Control, Machine Learning Control, etc.

[0009]. I have supervised 148 graduate and undergraduate students for mechanical engineering research projects or dissertations. These include 37 Ph.D., 77 M.S. and 34 B.S. students in the mechanical engineering departments in four academic institutions from 2010 to 2025. Such mentorships have been in the areas of modeling, design, experimental studies, and control of mechanical engineering systems.

[0010]. I am currently the Technical Editor for the International Journal of American Society of Mechanical Engineers (ASME)/ Institute of Electrical and Electronics Engineers (IEEE) Transactions on Mechatronics. In addition, I served six years as the Associate Editor for ASME Journal of Dynamic Systems, Measurement, and Controls (2017–2023), Associate Editor (2014-2020) for the International Journal of Powertrains (Inderscience Publishers) and a guest editor for a special issue on "Optimal Design and Operation of Energy Systems" in the International Journal of Optimal Control Applications and Methods (2020–2022). In these roles, I have regularly evaluated research work in the field of mechanical and electrical engineering systems.

[0011]. I have also served on the United States' National Science Foundation (NSF) and U.S. Department of Energy (DOE) review panels in the areas of mechanical engineering systems, controls, and energy systems. I have been a reviewer for: (i) international grant proposals from funding agencies from

the United States, Canada, Croatia, France, Germany, Poland, and the Netherlands, (ii) the U.S. Academy of Engineering research program, (iii) 24 international engineering journals, and (iv) Springer International Publishing for books in the areas of mechanical engineering systems and mechatronics.

[0012]. I have been a member of the Society of Automotive Engineers (SAE) (membership #6109271569) for about 20 years. I have organized a number of technical sessions in the area of internal combustion engines at SAE World Congress in Detroit during 2016 and 2022. In addition, I have been a member of SAE Technical Committee on New Engines, Components, Actuators and Sensors since 2016.

[0013]. I have been a member of the American Society of Mechanical Engineers (ASME) for the past thirteen years (membership #125958). I am a very active member of ASME's Dynamic Systems & Control Division and have served as the chair of the Energy Systems technical committee (2018–2020), chair of the Automotive Transportation Systems technical committee (2020–2022), and chaired 45 sessions and co-organized more than 70 technical sessions in the areas of modeling, design, optimization, and control of mechanical engineering systems. I am currently part of the ASME executive committee for the Dynamic Systems & Control Division.

[0014]. I have been awarded over $6.1 million in grants/support as a Principal Investigator (PI) and over $9.0 million as a co-PI from international, federal, provincial, and industry sources for conducting research in the areas of design, modeling, optimization, and control of mechanical engineering systems. For example, I along with two of my colleagues recently received 1,140,000 CAD in funding from the Canada National Sciences and Engineering Research Council (NSERC) and Diesel Tech Industries for the period 2025–2028 to design and control dual fuel engines running with hydrogen and diesel fuels.

[0015]. As the director of Energy Mechatronics Laboratory (EML) at the University of Alberta, I currently supervise/co-supervise 26 members for research and development (R&D) engineering works. These include 3 research associates, 5 post-doctoral scholars, 11 PhD students, 3 MSc graduate students, and 2 lab engineers and 2 undergraduate students. The majority of the EML projects are with industry partners specializing in mechanical engineering systems. Our works center on modeling, design, fabrication, testing of mechanical-electrical-chemical engineering systems. Over the past 12 years (UAlberta, MichiganTech), I have led R&D projects with more than 20 companies most of them global companies (e.g., Cummins, Westport, Ford, GM, …) for different engineering technologies. The majority of EML graduates/trainees (>70) are currently working in mechanical/electrical engineering companies in the U.S. and Canada.

[0016]. I have been recognized by different awards. Some of the recognitions/awards for my work related to internal combustion engines include:

- Transport Canada 2023 Technology Achievement Award Finalist, 2023.
- Best Presentation Award, SAE Int. Powertrain, Fuels & Lubricants Conference, Baltimore, MD, USA, 2016.
- Best Presentation in the Session, American Control Conference (ACC), 2012 (Montreal), 2015 (Chicago).
- Society of Automotive Engineers (SAE) International Ralph R. Teetor Educational Award, 2016 (An international award recognizing top engineering educators for outstanding contributions).
- Best Paper Award, ASME Automotive and Transportation Systems Technical Committee – ASME Dynamic Systems Control Conference, Columbus, OH, USA, 2015.
- Best Paper Award, ASME Automotive and Transportation Systems Technical Committee – ASME Dynamic Systems Control Conference, Fort Lauderdale, FL, USA, 2012.
- Canada NSERC (Natural Science and Engineering Research Council) Postdoctoral Fellowship, 2010 – 2012.

- Zita and John Rosen Teaching Excellence Award for Principal Instructor, University of Alberta, 2009 (An award for teaching Internal Combustion Engine (MECE 541) course. Only one award, across the university, is granted annually to give special recognition to a graduate student principal instructor who is an especially skilled and dedicated teacher).
- David Morris Graduate Scholarship in Automotive Engineering, University of Alberta, 2008.
- Winning Team (first prize) of a Total of 66 Research Teams from 26 Canadian Universities, Canada Automotive21 High Qualified Personnel Competition, Windsor, Canada, June 11-13, 2007.
- Chevron Graduate Scholarship in Natural Gas Engineering, University of Alberta, 2005.
- Best Paper Award in 3rd International Conference on Internal Combustion Engines, Tehran, Iran, 2004.
- Summa Cum Laude (ranked first among graduates) in MSc Mech Eng – Powertrain (2003), K. N. Toosi University of Technology, Tehran, Iran.

[0017]. My publications can be found at https://sites.ualberta.ca/~mahdi/Shahbakhti_Publications.html. These include more than 250 peer-reviewed publications in the field of mechanical engineering. Many of these publications are in the area of internal combustion engines. According to Google Scholar, these research publications have been recognized and cited over 6,400 times from more than 80 different countries.

[0018]. I have been retained as an expert in eight Inter Partes Review ("IPR") proceedings and two International Trade Commission ("ITS") proceedings in the past seven years to provide expert opinion in connection with different areas of mechanical engineering systems and mechatronics/control systems including: internal combustion engines, vehicles, powertrains, heating ventilation air conditioning (HVAC) systems, buildings, and vacuum systems.

[0019]. My full curriculum vitae (CV) is attached as Ex. 1004 to this report.

B. Compensation

[0020]. I have been retained by counsel for MWE Investments, LLC ("Petitioner") to provide my expert opinion in connection with mechanical and control systems for internal combustion engines, fuel regulators, fuel valves, and controllers.

[0021]. I am being compensated through WIT Legal, LCC in connection with this matter. WIT Legal, LCC is being compensated for my time in connection with this matter at a rate of $550 per hour. My compensation is in no way based on the outcome of this investigation or on the opinions that I provide. I have no interest, financial or otherwise, in the outcome of this matter. I have no financial interest in, or affiliation with, any of the parties in this matter.

C. Materials Considered

[0022]. The analysis that I provide in this Declaration is based on my education, research, and experience, as well as the documents I have considered. In forming my opinions, I have read and considered U.S. Patent No. 10,221,780 (hereafter referred to as the "'780 patent") and its prosecution history. I have cited to the following documents in my analysis below:

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Ex. 1023	K.K. Ramalingam, Handbook of Mechanical Engineering Terms (2d ed. 2009)

[0023]. All the opinions contained in this declaration are based on the documents that I reviewed and my knowledge and professional judgment. My opinions have also been guided by my understanding of how a person of ordinary skill in the art would have understood the claims of the ’780 patent.

[0024]. I reserve the right to supplement and amend any of my opinions in this declaration based on documents, testimony, and other information that becomes available to my after the date of this declaration.

II. STATEMENT OF LEGAL PRINCIPLES

[0025]. I am not a lawyer. My understanding of the legal standards to apply in reaching the conclusions in this declaration are based on discussions with counsel for Petitioner, my experience applying similar standards in other patent-related matters, and my reading of the documents submitted in this proceeding. In preparing this declaration, I have tried to faithfully apply these legal standards to the challenged claims.

A. Person of Ordinary Skill in the Art

[0026]. I understand that 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).

[0027]. I have also been advised that to determine the appropriate level of a person having ordinary skill in the art, the following factors may be considered: (1) the types of problems encountered by those working in the field and prior art solutions thereto; (2) the sophistication of the technology in question, and the rapidity with which innovations occur in the field; (3) the educational level of active workers in the field; and (4) the educational level of the inventor.

[0028]. For purposes of this IPR, a POSA would have a college degree in mechanical engineering, physics, or related fields, and three years of work experience in combustion engines. Additional higher graduate education could substitute for work experience, and additional work experience/training could substitute for formal education.

B. Prior Art

[0029]. I have been advised and understand that the information used to evaluate whether an invention was new is generally referred to as "prior art." I understand that prior art includes patents and printed publications that existed before the earliest priority date or the earliest filing date of the patent (which I have been informed is also called the "effective filing date"). I have been informed and understand that a patent or published patent application is prior art if it was filed before the earliest filing date of the claimed invention and that a printed publication is prior art if it was publicly available before the earliest filing date.

C. Claim Construction

[0030]. I understand that a purpose of claim construction is to determine what a person of ordinary skill in the art would have understood the claim terms to mean. Claim terms are generally given their ordinary and customary meaning, which is the meaning that the term would have to a person of ordinary skill in the art in question as of the effective filing date.

[0031]. I understand that the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification. I understand that the patent specification, under the legal principles, has been described as the single best guide to the meaning of a claim term, and is thus highly relevant to the interpretation of claim terms. And I

understand for terms that do not have a customary meaning within the art, the specification usually supplies the best context of understanding the meaning of those terms.

[0032]. I further understand that other claims of the patent in question, both asserted and unasserted, can be valuable sources of information as to the meaning of a claim term. Because the claim terms are normally used consistently throughout the patent, the usage of a term in one claim can often illuminate the meaning of the same term in other claims. Differences among claims can also be a useful guide in understanding the meaning of particular claim terms.

[0033]. I understand that the prosecution history can further inform the meaning of the claim language by demonstrating how the inventors understood the invention and whether the inventors limited the invention in the course of prosecution, making the claim scope narrower than it otherwise would be. Extrinsic evidence, such as dictionaries, may also be consulted in construing the claim terms.

[0034]. I understand that, in Inter Partes Review (IPR) proceedings, a claim of a patent shall be construed using the same claim construction standard that would be used to construe the claim in a civil action filed in a U.S. district court (which I understand is called the “Phillips” claim construction standard), including construing the claim in accordance with the ordinary and customary meaning of

such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.

[0035]. Accordingly, I have been instructed by counsel to apply the "Phillips" claim construction standard for purposes of interpreting the claims in this proceeding, to the extent they require a construction.

D. Anticipation (§102)

[0036]. I understand that under 35 U.S.C. §102, a patent claim is unpatentable for anticipation if the claimed subject matter was patented or described in a printed publication before the effective filing date of the claimed invention. I have been informed that this is referred to as unpatentability by anticipation. I have also been informed that a patent claim is anticipated under § 102 if a single prior art reference discloses all limitations of the claimed invention.

E. Obviousness (§103)

[0037]. I understand that a patent claim is obvious if, as of the effective filing date, it would have been obvious to a person having ordinary skill in the field of the technology (the "art") to which the claimed subject matter belongs.

[0038]. I understand that the following factors should be considered in analyzing obviousness: (1) the scope and content of the prior art; (2) the differences between the prior art and the claims; and (3) the level of ordinary skill in the pertinent art. I also understand that certain other facts known as "secondary

considerations" such as commercial success, unexplained results, long felt but unsolved need, industry acclaim, simultaneous invention, copying by others, skepticism by experts in the field, and failure of others may be utilized as indicia of non-obviousness. I understand, however, that secondary considerations should be connected, or have a "nexus," with the invention claimed in the patent at issue.

[0039]. I understand that a reference qualifies as prior art for obviousness purposes when it is analogous to the claimed invention. The test for determining what art is analogous is: (1) whether the art is from the same field of endeavor, regardless of the problem addressed, and (2) if the reference is not within the field of the inventor's endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved.

[0040]. I understand that a person of ordinary skill in the art is assumed to have knowledge of all prior art. I understand that one skilled in the art can combine various prior art references based on teachings of those prior art references, general knowledge present in the art, or common sense. I understand that a motivation to combine references may be implicit in the prior art, and there is no requirement that there be an actual or explicit teaching to combine two references. Thus, one may take into account the inferences and creative steps that a person of ordinary skill in the art would employ to combine the known elements in the prior art in the manner claimed by the patent at issue. I understand that one

should avoid "hindsight bias" and ex post reasoning in performing an obviousness analysis. But this does not mean that a person of ordinary skill in the art for purposes of the obviousness inquiry does not have recourse to common sense.

[0041]. I understand that when determining whether a patent claim is obvious in light of the prior art, neither the particular motivation for the patent nor the stated purpose of the patentee is controlling. The primary inquiry has to do with the objective reach of the claims, and that if those claims extend to something that is obvious, then the entire patent claim is invalid.

[0042]. I understand one way that a patent can be found obvious is if there existed at the time of the invention a known problem for which there was an obvious solution encompassed by the patent's claims. I understand that a motivation to combine various prior art references to solve a particular problem may come from a variety of sources, including market demand or scientific literature. I understand that a need or problem known in the field at the time of the invention can also provide a reason to combine prior art references and render a patent claim invalid for obviousness. I understand that familiar items may have obvious uses beyond their primary purpose, and that a person of ordinary skill in the art will be able to fit the teachings of multiple prior art references together like the pieces of a puzzle. I understand that a person of ordinary skill is also a person of at least ordinary creativity. I understand when there is a design need or market

pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this finite number of predictable solutions leads to the anticipated success, I understand that the invention is likely the product of ordinary skill and common sense, and not of any sort of innovation.

[0043]. I understand that the fact that a combination was obvious to try might also show that it was obvious, and hence invalid, under the patent laws. I understand that if a patent claims a combination of familiar elements according to known methods, the combination is likely to be obvious when it does no more than yield predictable results. Thus, if a person of ordinary skill in the art can implement a predictable variation, an invention is likely obvious. I understand that combining embodiments disclosed near each other in a prior art reference would not ordinarily require a leap of inventiveness.

[0044]. I understand that obviousness may be shown by demonstrating that it would have been obvious to modify what is taught in a single piece of prior art to create the patented invention. Obviousness may also be shown by demonstrating that it would have been obvious to combine the teachings of more than one item of prior art. I understand that a claimed invention may be obvious if some teaching, suggestion, or motivation exists that would have led a person of ordinary skill in the art to combine the invalidating references. I also understand

that this suggestion or motivation may come from the knowledge of a person having ordinary skill in the art, or from sources such as explicit statements in the prior art. I understand that when there is a design need or market pressure, and there are a finite number of predictable solutions, a person of ordinary skill may be motivated to apply common sense and his skill to combine the known options in order to solve the problem.

[0045]. I understand the following are examples of approaches and rationales that may be considered in determining whether a piece of prior art could have been combined with other prior art or with other information within the knowledge of a person having ordinary skill in the art:

- Some teaching, motivation, or suggestion in the prior art that would have led a person of ordinary skill to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed invention;
- Known work in one field of endeavor may prompt variations of it for use in the same field or a different field based on design incentives or other market forces if the variations would have been predictable to a person of ordinary skill in the art;
- Combining prior art elements according to known methods to yield predictable results;

- Applying a known technique to a known device, method, or product ready for improvement to yield predictable results;
- Applying a technique or approach that would have been "obvious to try" (choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success);
- Simple substitution of one known element for another to obtain predictable results; or
- Use of a known technique to improve similar products, devices, or methods in the same way.

[0046]. I understand that, when determining whether a claimed combination is obvious, the correct analysis is not whether one of ordinary skill in the art, writing on a blank slate, would have chosen the particular combination of elements described in the claim. Instead, I understand the correct analysis considers whether one of ordinary skill, facing the wide range of needs created by developments in the field of endeavor, would have seen a benefit to selecting the combination claimed.

[0047]. I understand that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference. The test for obviousness, in other words, is not whether the

references could be physically combined but whether the claimed inventions are rendered obvious by the teachings of the prior art as a whole.

III. SUMMARY OF THE '780 PATENT

[0048]. The '780 patent generally relates to "a mechanical fuel lockout switch [38] for a dual fuel engine." Ex. 1001, Abstract. The "[m]echanical fuel lockout switch 38, FIG. 2, includes a mechanical fuel valve 54 actuatable between first position 38(a) as shown in FIG. 2 and second position 38(b) as shown in FIG. 3 to selectively control fuel flow to the dual fuel engine from first fuel source 28 through a first fuel line and second fuel source 30 through a second fuel line 36." Ex. 1001, 5:31-36.

[0049]. "Mechanical fuel valve 54 opens the first fuel line (to enable liquid fuel flow to the engine) when fuel valve handle 56 is in the first position, and mechanical fuel valve 54 closes the first fuel line (to prevent liquid fuel flow to the engine) when fuel valve handle 56 is in the second position." Ex. 1001, 6:2-6. "Fuel valve handle 56 is coupled to fuel lockout apparatus 58." Ex. 1001, 6:10-11.

[0050]. "Fuel lockout apparatus 58 is controlled by fuel valve handle 56 so that moving fuel valve handle 56 to the first position causes fuel lockout apparatus 58 to block fuel inlet 59 for LPG and moving fuel valve handle 56 to the second position causes fuel lockout apparatus 58 to unblock fuel inlet 59 for LPG." Ex. 1001, 6:13-18.

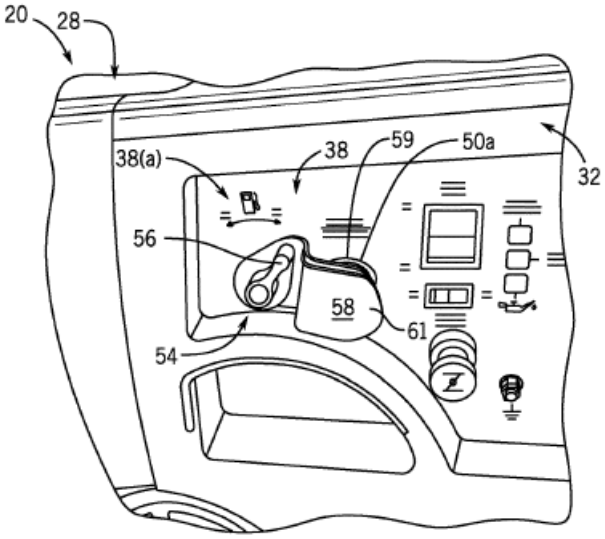


FIG. 2

Ex. 1001, FIG. 2.

[0051]. "Referring to FIG. 3, a detail view of a portion of generator 20 of FIG. 1 depicts mechanical fuel lockout switch 38 in a second position 38(b), in accordance with an embodiment of the invention. In this position, the mechanical fuel lockout switch 38 provides a disconnect to stop gasoline flow from gasoline tank 32 to the engine while allowing connection of LPG supply hose 36 to fuel inlet 59 of the second fuel line. FIG. 3 further shows LPG supply hose 36 coupling second fuel source 30 to generator 20 to deliver LPG to run the generator." Ex. 1001, 6:32-41.

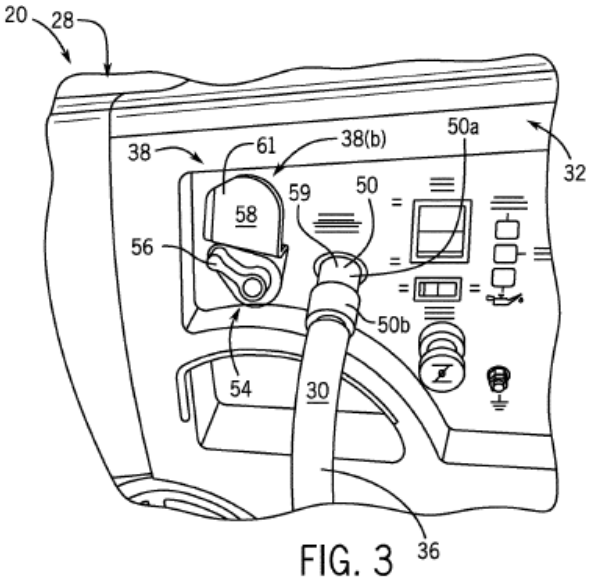


FIG. 3

Ex. 1001, FIG. 3.

IV. THE CHALLENGED CLAIMS

[0052]. This Declaration address claims 1-15 of the '780 patent. Claims 1, 8 and 15 are independent claims. Claims 2, 3, and 6 depend from independent claim 1. Claims 4 and 5 depend from claim 3. Claim 7 depends from claim 6. Claims 9-11 and 14 depend from independent claim 8. Claims 12 and 13 depend from dependent claim 11.

V. APPLICATION OF PRIOR ART TO THE CHALLENGED CLAIMS

[0053]. I have reviewed and analyzed the prior art references and materials listed in §I.C, supra. In my opinion the claims of the '780 patent would have been obvious to a person of ordinary skill in the art based on the following combinations of the prior art.

Ground	Basis	Challenged Claims	Reference(s)
1	§103	1, 2, 3, 4, 6, 7 and 15	DuroMax and Elsdon
2A	§102	1, 6, 7 and 9	Hallberg
2B	§103	2 and 15	Hallberg
3	§103	8, 9, 11 and 14	Rumao, DuroMax, and Elsdon, and alternatively, Rumao and Hallberg
4	§103	12 and 13	Rumao, DuroMax, Elsdon and Parlatore, and alternatively, Rumao, Hallberg, and Parlatore
5	§103	5	DuroMax, Elsdon, and Parlatore
6	§103	10	Rumao, DuroMax, and Elsdon

[0054]. I am informed by counsel that each of the references cited in the grounds above qualifies as prior art to the challenged claims because each reference was filed before the '780 patent priority date of June 12, 2015.

A. Brief Summary of Prior Art

1. Overview of DuroMax XP4400EH Operator's Manual ("DuroMax").

[0055]. DuroMax (Ex. 1004) was published/publicly available at least by November 1, 2012, before the filing date of the earliest application to which the '780 Patent claims priority. Ex.1004, ¶¶18-19. DuroMax is thus prior art to the '780 Patent under 35 U.S.C. §102(a).

[0056]. DuroMax discloses the XP4400EH dual fuel generator—a dual fuel generator that runs alternatively off gasoline or liquefied petroleum gas (LPG). The generator includes a mechanical gasoline fuel shutoff valve having a valve handle. The generator also includes an LPG fuel inlet.

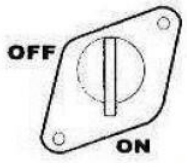


Figure 6 - fuel valve in the "on" position

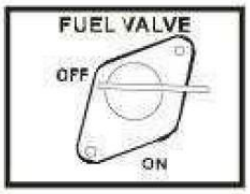


Figure A - Fuel Valve in the "OFF" position

Ex.1004, pp.11,12.

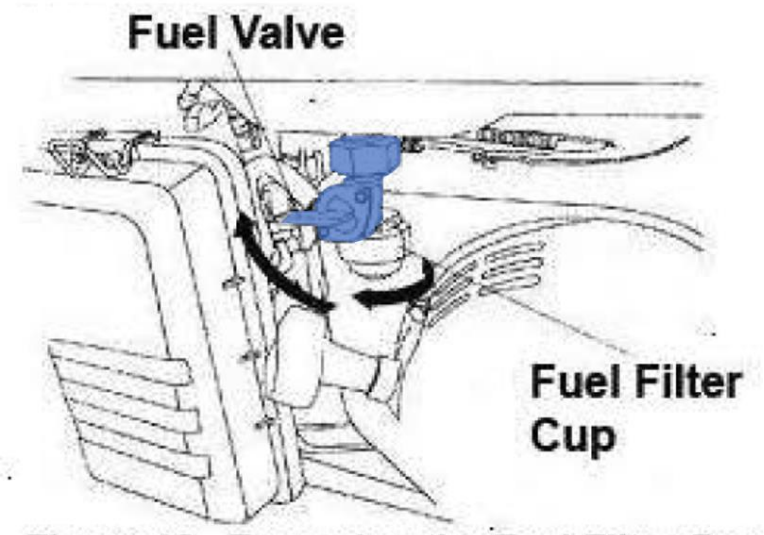
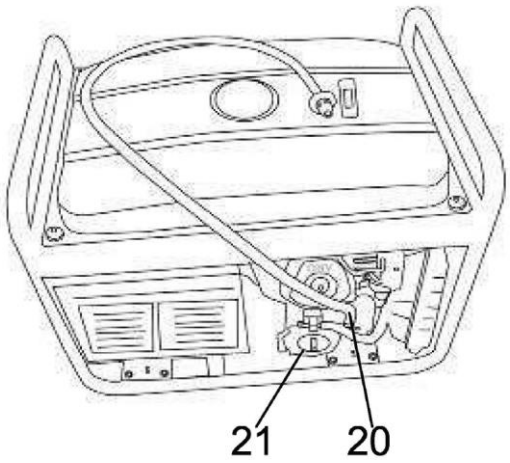


Figure 19 –Removing the Fuel Filter Cup

Ex. 1004, p.20.

[0057]. The generator also includes an LPG fuel inlet.



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

Ex. 1004, p.7-8.

2. Overview of U.S. Patent No. 5,718,265 ("Elsdon")

[0058]. Elsdon (Ex. 1005) was filed on February 24, 1995. Elsdon issued on February 17, 1998. Elsdon is thus prior art to the '780 Patent under 35 U.S.C. § 102(a).

[0059]. Elsdon discloses an assembly having cap 16 and shield 14 assembly of a fluid conduit coupler 12 that is used for "flammable or other hazardous fluids, such as fuel…." Ex.1005, 1:10-13, 3:3-4 and FIG. 9.

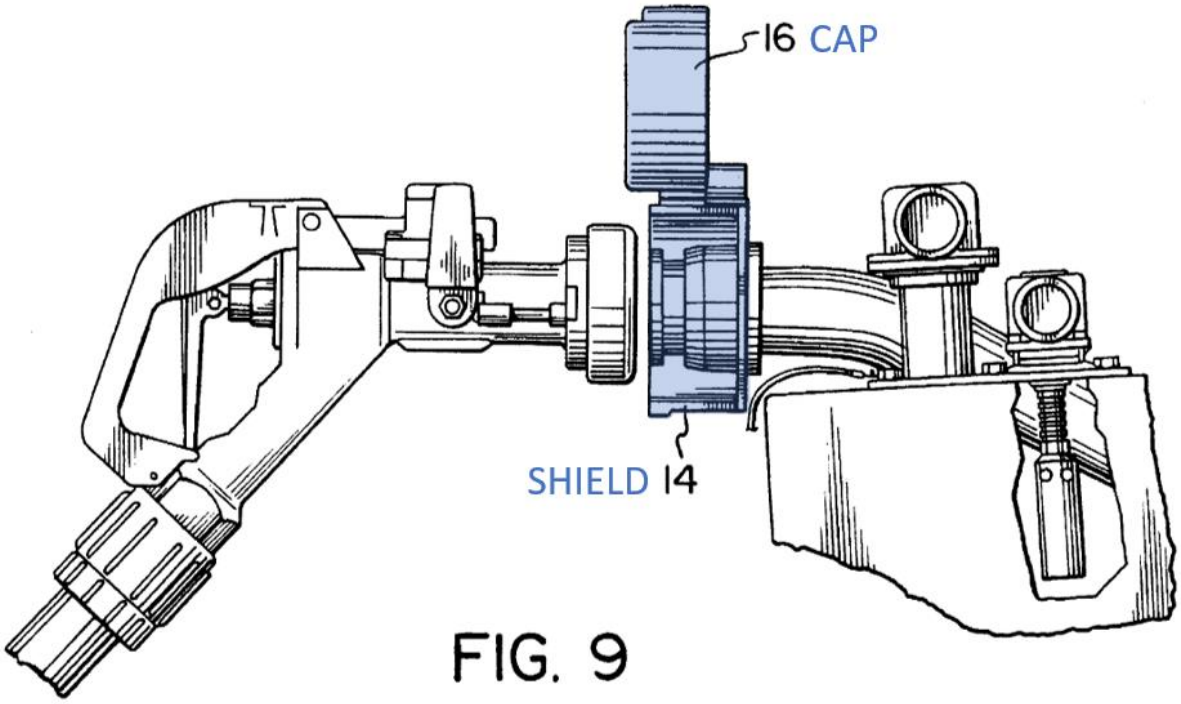


FIG. 9

Ex.1005, FIG. 9 (Emphasis Added).

[0060]. Cap 16 is hingedly connected to shield 14 and is readily moveable between an open position (FIG. 9 above and FIG. 1 below) and a closed position (FIG. 2 below) in which the cap 16 is positioned over the coupler 12 to prevent coupling with a fuel hose. Ex.1005, 3:4-11.

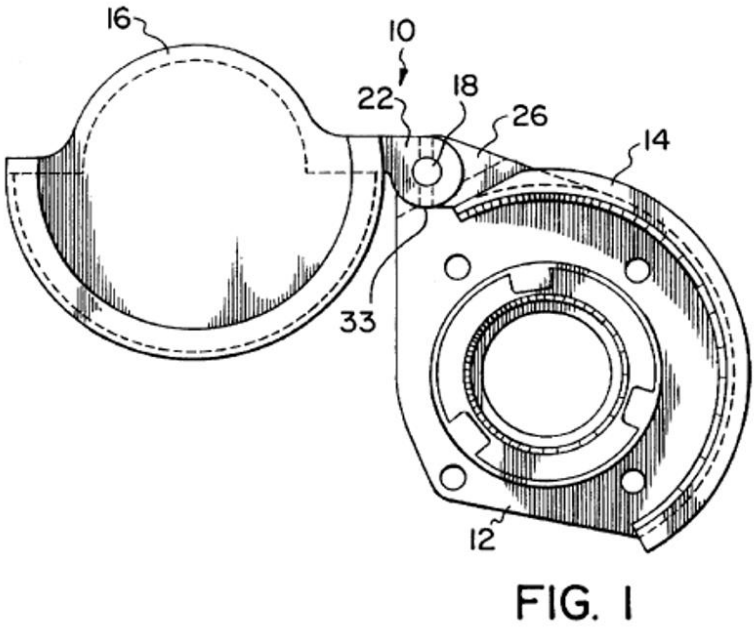


FIG. 1

Ex.1005, FIG. 1.

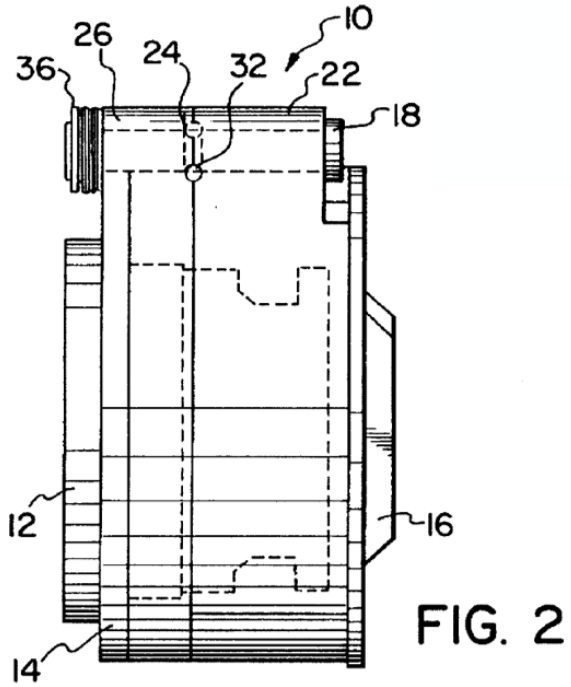


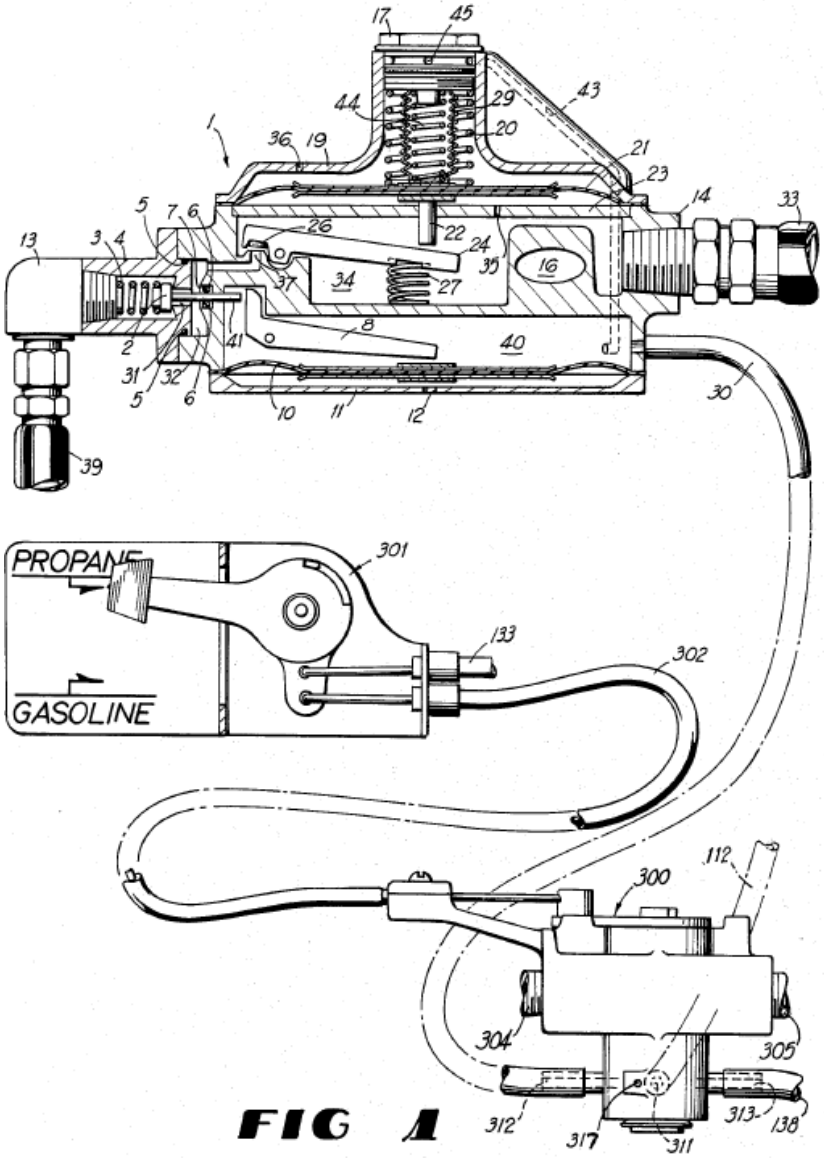
FIG. 2

Ex.1005, FIG. 2.

3. Overview of U.S. Patent No. 4,492,207 ("Hallberg")

[0061]. Hallberg (Ex. 1006) was filed on February 27, 1981, and issued on January 8, 1985. Hallberg is thus prior art to the '780 Patent under 35 U.S.C. § 102(a).

[0062]. Hallberg discloses a dual fuel system for use with internal combustion engines. Ex. 1006, Abstract. Fuel to be utilized is selected by positioning fluid dual value control 301 in one of two positions, either "gasoline" or "propane." Ex. 1006, 7:27-29, Fig. 1.

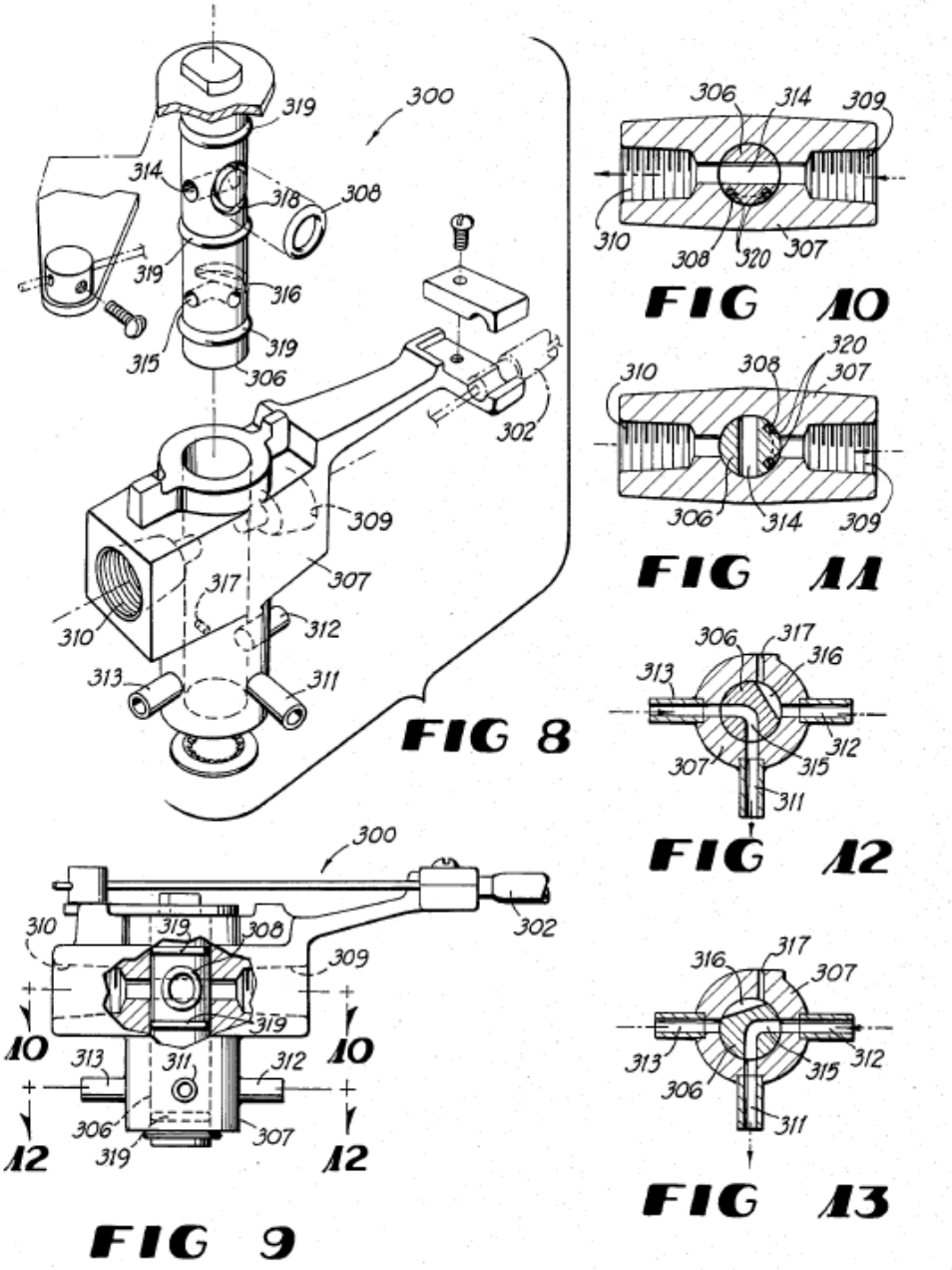


Ex. 1006, FIG. 1.

[0063]. Positioning of control 301 in the "gasoline" mode acts through control cable 302 to rotate spool 306 within valve body 307. Ex. 1006, 7:30-32. Simultaneously, gasoline from gasoline supply line 304 is supplied to the carburetor 110 through engine gasoline line 305, which lines communicate through

tunnel 314 (as shown in FIG. 10) connecting liquid inlet opening 309 and liquid outlet opening 310 in fluid dual valve 300. In this mode, the carburetor functions normally. Ex. 1006, 7:33-44.

[0064]. When the "propane" mode of control 301 is selected, spool 306 is rotated within valve body 307 by control cable 302 such that O-ring 308 on the face of spool 306 forms a seal between spool 306 and valve body 307 around liquid inlet opening 309 (as shown in FIG. 11) thereby prohibiting flow of gasoline to a conventional carburetor 110. Ex. 1006, 8:3-10.



Ex. 1006, FIGS. 8-13.

[0065]. 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. Ex. 1006,

8:31-36. Atmospheric pressure on the opposite side of diaphragm 10 urges diaphragm upward against the liquid inlet lever 8, the opposite end of which drives inlet valve shaft 41 against bias spring 3 and opens liquid inlet valve 2. Ex. 1006, 8:36-40. Upon opening valve 2, liquified gaseous fuel (e.g., propane) flows through inlet valve orifice 31 into liquified fuel passage 32 and onto the mixer 100. Ex. 1006, 8:40-60. When valve 2 is closed, valve 2 and related structures provide a "lock-off" of liquified gaseous fuel. Ex. 1006, 7:64-68.

4. Overview of U.S. Patent No. 10,337,399 to Rumao ("Rumao")

[0066]. Rumao (Ex. 1007) was filed October 3, 2016, and issued July 2, 2019. Rumao is a continuation of Application No. 14/169,739, filed January 31, 2014, which claims priority to a provisional application filed February 2, 2013. A POSA would therefore understand that Rumao is prior art to the '780 Patent under 35 U.S.C. §102(a).

[0067]. Rumao discloses methods for assembling a portable generator system. Ex. 1007, Abstract. In one configuration, the portable generator system includes a portable generator 20 having an internal combustion engine powered by propane or gasoline, an onboard fuel tank 40 configured to store fuel supplied to engine 30 by a fluid coupling such as a tube or hose, and a control panel 50 for operating and monitoring the generator. Ex. 1007, 5:6-12, 5:24-30. Figure 4

illustrating the engine 30, fuel tank 40, and control panel 50 of generator 20 is provided below.

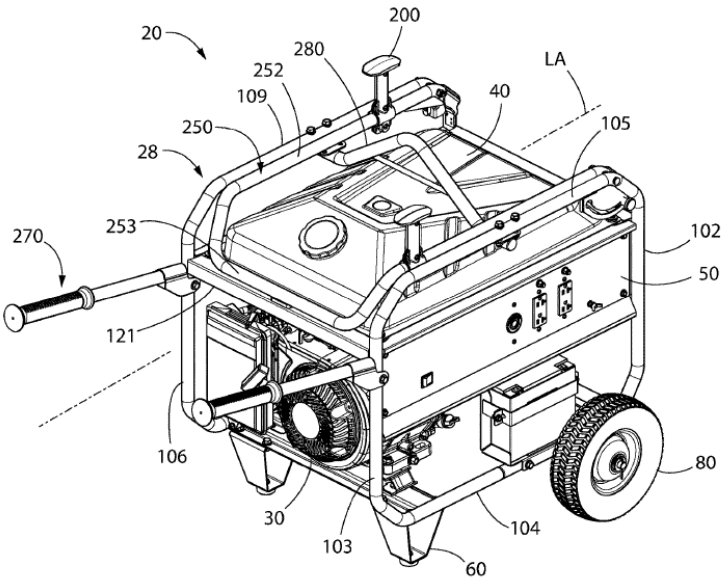


FIG. 24

Ex. 1007, FIG. 24.

[0068]. Rumao also discloses an alternative configuration whereby the portable generator system includes a generator frame 301 supporting a permanent fuel tank 360, a removable fuel tank 380, engine 311, control panel 400, and other accessories for forming a functional generator. Ex. 1007, 18:34-40. In this configuration, any suitable type of engine and fuel source may be used, "including … liquid fuels or gaseous fuels such as propane." Ex. 1007, 18:40-43.

[0069]. Figure 82 illustrating the permanent fuel tank 360, and removable fuel tank 380 of the alternative configuration is provided below.

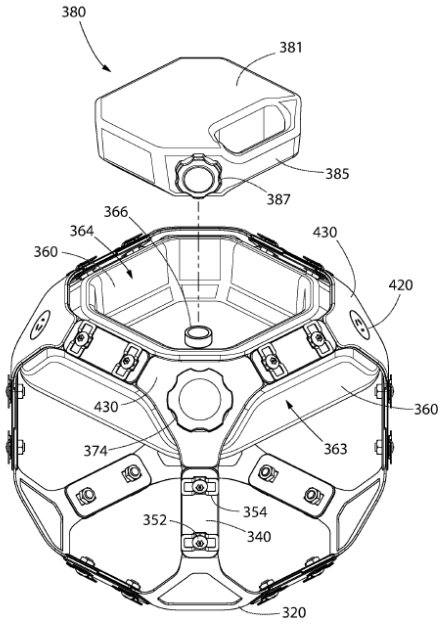


FIG. 82

Ex. 1007, FIG. 82.

[0070]. Rumao also discloses additional non-limiting examples of generators that include "all related appurtenances and accessories necessary for a fully functional generator system (e.g., alternator, electrical system, pressure regulators, relief valves, controls, electrical outlets, etc.)." Ex. 1007, 29:20-33.

5. Overview of U.S. Patent Application No. 2011/0100335 A1 to Parlatore ("Parlatore")

[0071]. Parlatore was filed November 5, 2009 and published May 5, 2011. Parlatore is thus prior art to the '780 Patent under 35 U.S.C. § 102(a).

[0072]. Parlatore discloses a "method and system [having] one or more fuel storage tanks housing propane, one or more regulators through which fuel may

flow and one or more fuel metering devices or systems." Ex. 1010, Abstract. Parlatore also discloses that a "LPG tank 102 may be connected to a regulator, such as a primary regulator 106." Ex. 1010, [0016]. "The primary regulator 106 may step down the pressure of any stored propane vapor energy in tank 102, and may further output this lowered pressure to a secondary regulator 110." *Id.* The secondary regulator 110 can act as a vacuum-controlled flow rate regulator. *Id.*

[0073]. The LPG tank 300 may be connected to the primary regulator 304 by connector 302. Ex. 1010, [0020]. A low pressure output of the secondary regulator 308 may be attached to a propane carburetor (not pictured) on the engine 310 in any of a variety of manners, for example through hose 312 and coupling 314. *Id.* A low pressure output of the secondary regulator 308 may be attached to the propane carburetor either permanently or releasably. *Id.*

[0074]. As shown in FIG. 3 (below), the primary regulator 304 and the secondary regulator 308 can be two separate regulators that can be based on the design and size of an engine. Ex. 1010, [0021]. In this example, the primary regulator 304 may be connected to LPG tank 300, and connected to the secondary regulator 308 by a hose 306, pipe, tube or the like. Ex. 1010, [0021].

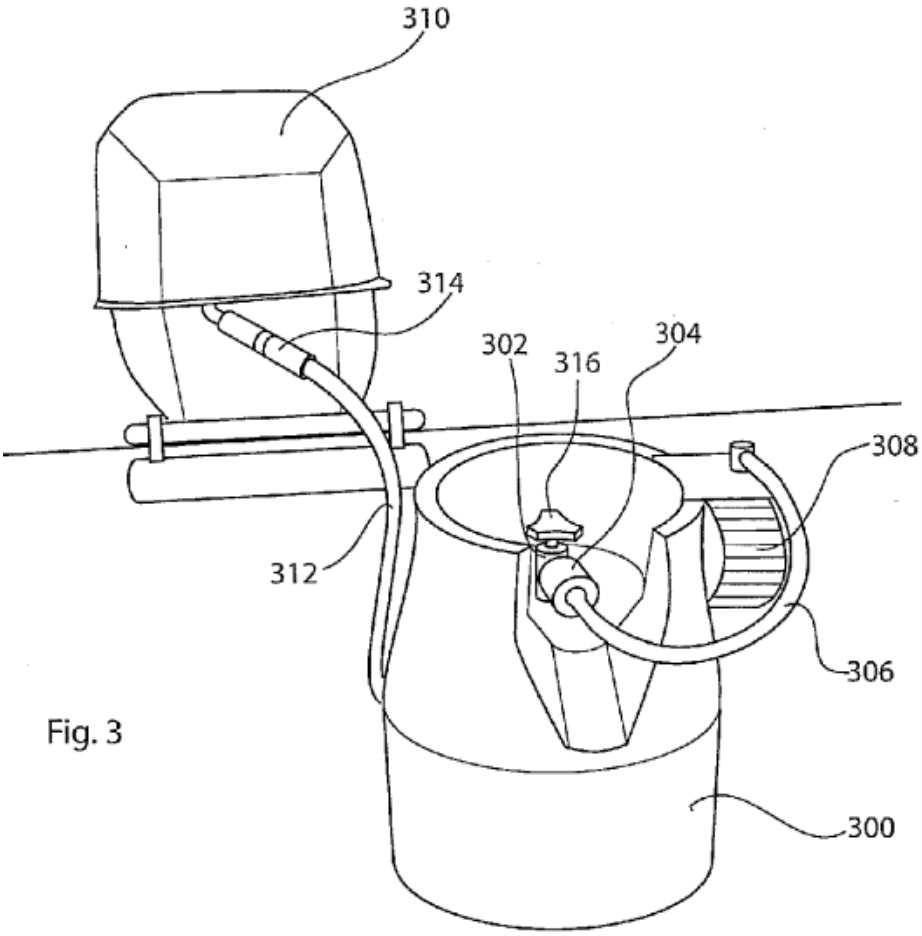


Fig. 3

Ex. 1010, Fig. 3.

VI. CLAIM TERMS

[0075]. I have been instructed that claims should be given their ordinary and customary meaning as understood by a POSA viewing the claim terms in the context of the entire patent. I have also been instructed that claims must always be read in light of the specification as the specification is the single best guide to the meaning of a disputed term. When a patentee defines a claim term, the patentee's definition governs.

A. The Claimed "Fuel Lockout Apparatus"

Claim 1 of the '780 Patent recites:

> [A] **fuel lockout apparatus** coupled to the mechanical fuel valve…[and] configured to: prevent the second fuel source from coupling to the second fuel line while the mechanical fuel valve is in the first position; and permit the second fuel source to couple to the second fuel line while the mechanical fuel valve is in the second position.

[0076]. I have been told that Section 112(f) applies to claim terms that recite "function without reciting sufficient structure for performing that function." *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1349 (Fed. Cir. 2015). The "critical question" in making this assessment "is whether the claim term is used in common parlance or by persons of skill in the pertinent art to designate structure." *MTD Prods. Inc. v. Iancu*, 933 F.3d 1336, 1341 (Fed. Cir. 2019) (internal citations omitted). Generic terms such as "mechanism," "element," "device," and other nonce words... [are] tantamount to using the word "means" because they "typically do not connote sufficiently definite structure" and therefore invoke Section 112(f). *Williamson*, 792 F.3d at 1350 (Fed. Cir. 2015). Section 112(f) analysis of the term "fuel lockout apparatus" is discussed in §VI.A.1.

[0077]. Alternatively, in lieu of Section 112(f) applying to the term "fuel lockout apparatus," the plain and ordinary meaning of the term "fuel lockout apparatus" as understood by a POSA is discussed in §VI.A.2.

1. "Fuel Lockout Apparatus" as Recited in the Specification

[0078]. The term "fuel lockout apparatus" recites a function without providing any structure or performing that function. The claim merely replaces the term "means" with "apparatus." The term "fuel lockout apparatus" has no independent meaning aside from "a means for providing fuel lockout."

i. The Corresponding Structure for "Fuel Lockout Apparatus"

[0079]. The '780 Patent describes a single embodiment of a "fuel lockout apparatus." In that embodiment, the "fuel lockout apparatus 58" is a "flange" that "is rigidly coupled to the rotating handle [56]." Ex.1001, 6:19-25. The flange "extends radially outward from fuel valve handle 56" and "sweeps over" the LPG fuel hose coupling "as the fuel valve handle rotates." *Id.* Based on the user selection, the flange "blocks off" or "uncovers" the "first end 50a of the quick-disconnect hose coupling when fuel valve handle is rotated" between the first and second positions.

[0080]. Specifically, when the fuel lockout apparatus is in the first position (selecting gasoline), the flange provides a barrier that extends over the fuel hose coupling 50a and prevents the user from coupling an LPG supply hose to the fuel hose coupling 50, thereby providing LPG fuel lockout. Ex.1001, 7:4-17; FIGS. 2, 4A.

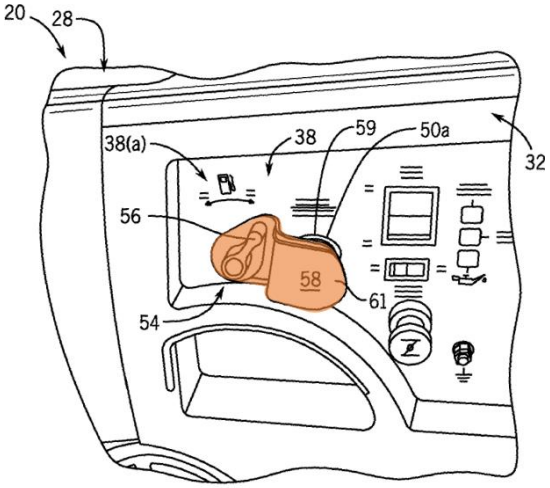


FIG. 2

Ex.1001, FIG. 2 (Emphasis Added).

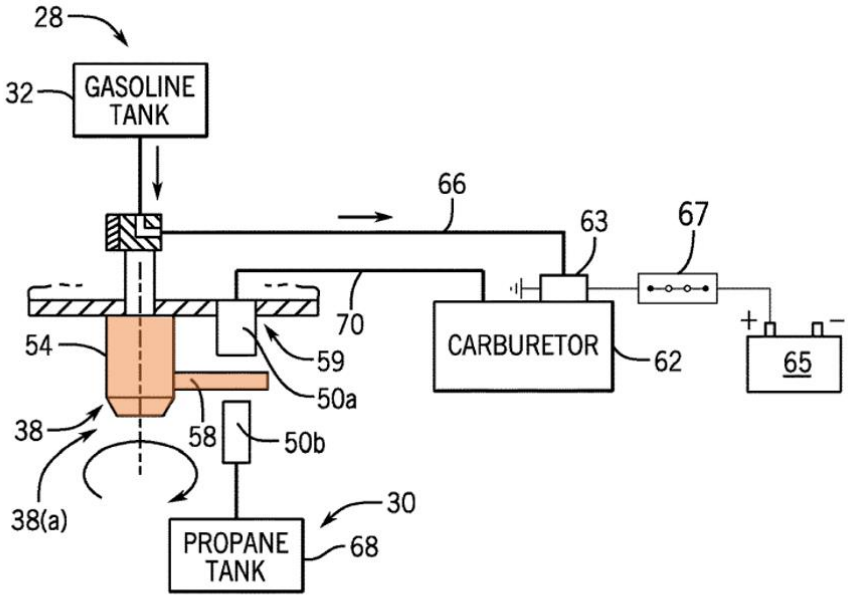


FIG. 4A

Ex.1001, FIG. 4A (Emphasis Added).

[0081]. When the fuel lockout apparatus is in the second position (selecting LPG), the flange prevents the user from selecting gasoline until the LPG

supply hose is removed, and thereby providing gasoline fuel lockout. Ex.1001, 7:18-29, and FIGS. 3, 4B.

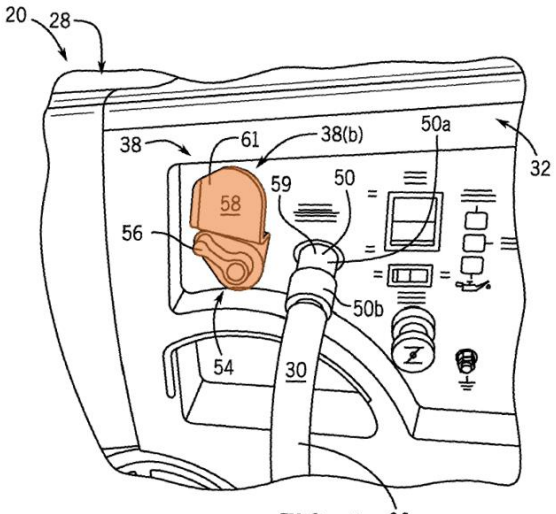


FIG. 3

Ex.1001, FIG. 3 (Emphasis Added).

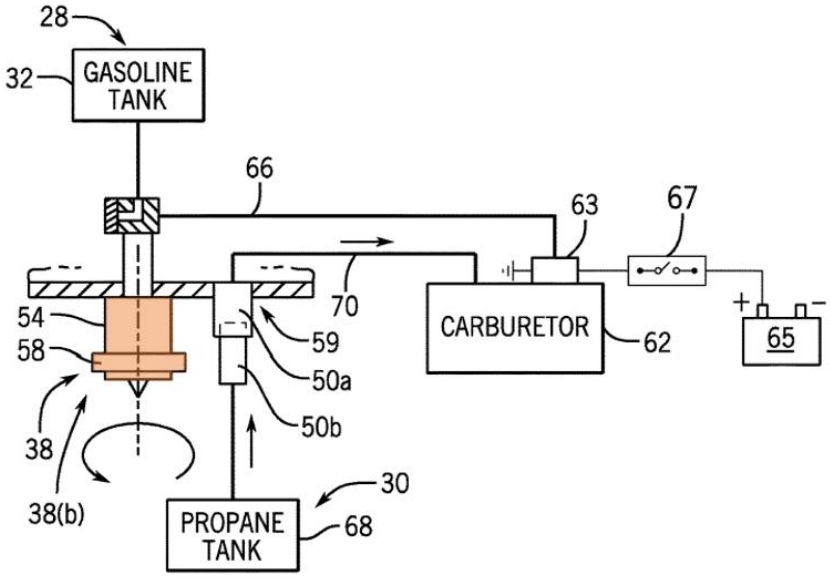


FIG. 4B

Ex.1001, FIG. 4B (Emphasis Added)

[0082]. The flange that extends radially outward from the valve handle and rotates with the valve handle over the fuel hose coupling is what provides both the gasoline and LPG lockout functionality. Thus, the proper structure corresponding to the "providing fuel lockout" functionality is: items 58, 61 in Figs. 2, 3, 4A, 4B, as described at Ex. 1001,5:37-64; 6:10-31; 6:42-7:17; 7:54-67; 8:49-64.

2. Plain and Ordinary Meaning of "Fuel Lockout Apparatus" and "Coupled"

[0083]. An "apparatus," is defined as a "set of…equipment designed for a particular use." Ex. 1009, pp. 1-6. From this definition, it is clear that an "apparatus" includes a combination of different parts and equipment to serve a specific purpose. The "apparatus" can include valves (mechanical, electrical), chambers, gears, tubes, pumps, blowers, analyzers, sensors, controllers, or electronic actuators to serve intended purposes.

[0084]. A POSA would therefore understand that a fuel lockout apparatus includes elements that together are designed for a particular use. A POSA also would also understand that the plain and ordinary meaning of the adjective "fuel lockout" is "preventing the flow of fuel."

[0085]. Accordingly, a POSA would understand that the plain and ordinary meaning of the composite term "fuel lockout apparatus" is therefore a "set of…equipment designed" for "preventing the flow of fuel."

[0086]. Moreover, "coupled" is defined as "to join or combine." Ex. 1009, pp. 8-9. A POSA would therefore understand that "coupled" means "joined or combined together." A POSA would also understand that the plain and ordinary meaning of "coupled" without further limitation in the specification or claims, would include "mechanically coupled," "electrically coupled," "fluidly coupled," "hydraulically coupled," and the like.

[0087]. As described in detail below, a POSA's understanding of the plain and ordinary meaning of the terms "apparatus" and "coupled" are supported in internal combustion engine and mechanical engineering literature.

i. Use of the Term "apparatus" in Internal Combustion Engine Literature

[0088]. The definition of **"apparatus"** is aligned with how the term has been used in internal combustion engine (ICE) literature. Some of the examples of using term "apparatus" in ICE literature include: ignition apparatus, suction gas apparatus, starting apparatus, flow apparatus, electronic apparatus, vapor pressure apparatus, emission apparatus, refrigerating apparatus, cleaning apparatus, test apparatus, heating apparatus, cooling apparatus, adjustable guide apparatus, and

exhaust apparatus – these apparatuses support different aspects of operation of internal combustion engines.

[0089]. In forming my opinion, I have reviewed the following ICE literature:

- Rolla C. Carpenter & H. Diederichs, *Internal Combustion Engines* (2d ed. 1909).
- Rowlands S. Benson & N.D. Whitehouse, *Internal Combustion Engines* (Pergamon Press 1979).
- Constantine Arcoumanis, *Internal Combustion Engines* (Academic Press 1988).
- Richard Stone, *Introduction to Internal Combustion Engines* (3d ed. 1999).
- A.J. Martyr & M.A. Plint, *Engine Testing: Theory and Practice* (3d ed. 2007).
- Günter P. Merker, Christian Schwarz & Rüdiger Teichmann, *Combustion Engines Development* (Springer 2012).
- M.K. Gajendra Babu & K.A. Subramanian, *Alternative Transportation Fuels: Utilisation in Combustion Engines* (CRC Press 2013).

[0090]. As found in *Internal Combustion Engines*, the term "apparatus" is used to describe a **"refrigerating apparatus"** for maintaining engine temperature. *See* Ex. 1021, p. 22.

[0091]. "Apparatus" is also used to describe an **"ignition apparatus"** when explaining the importance of adjusting ignition timing for every different fuel mixture and every different piston speed. *See* Ex. 1021, p. 91.

[0092]. "Apparatus is also used to describe **"apparatus L K S"** that includes multiple parts L, K, S (see below) to ensure the water is kept thoroughly stirred. Ex. 1021, p. 130. "The whole apparatus is carefully protected against radiation by an outer vessel." *Id*.

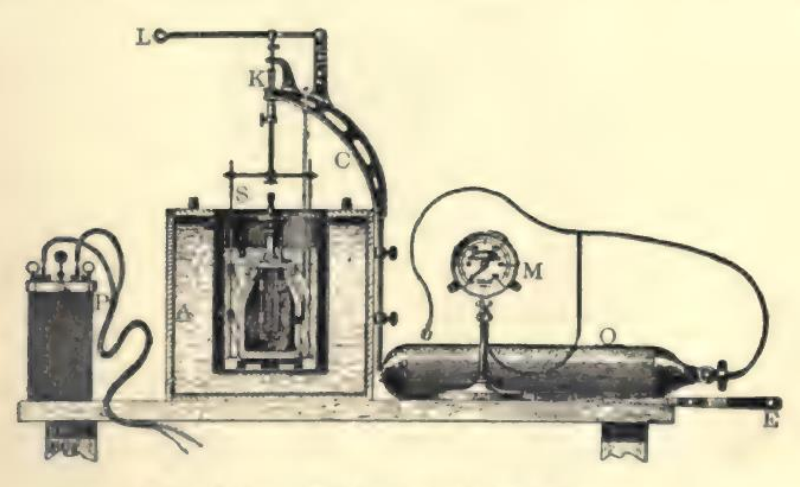


FIG. 6–1. — Mahler Bomb Calorimeter.

[0093]. Apparatus is also used as a **"cleaning apparatus"** for cleaning equipment to remove/clean hydrocarbons from burning tar gases. Ex. 1021, pp. 157-158.

[0094]. Apparatus is also used as a **"Loomis-Pettibone gas apparatus"** in Figure 7-20 (see below) that may be used for the making of producer gas alone, or for alternate manufacture of water gas and lean power gas. Ex. 1021, p. 174.

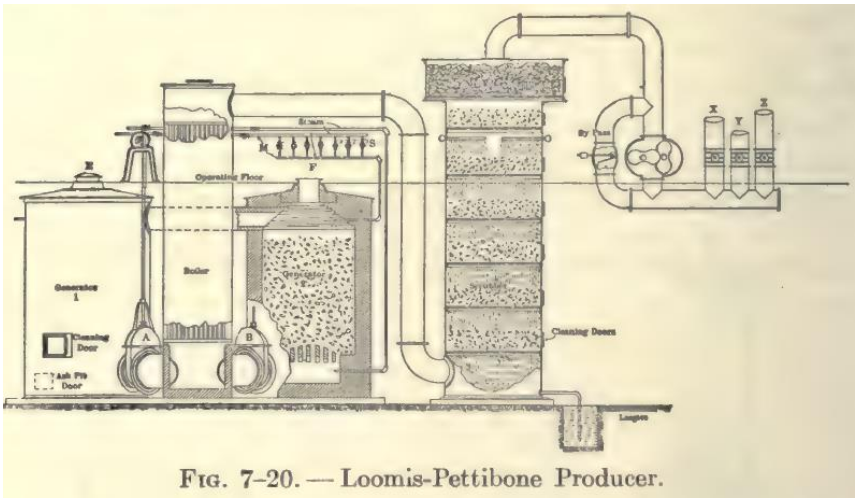


FIG. 7–20. — Loomis-Pettibone Producer.

[0095]. Apparatus is also used as an **"ignition apparatus"** for an Otto engine in Figure 11-20 (see below). Ex. 1021, p. 252.

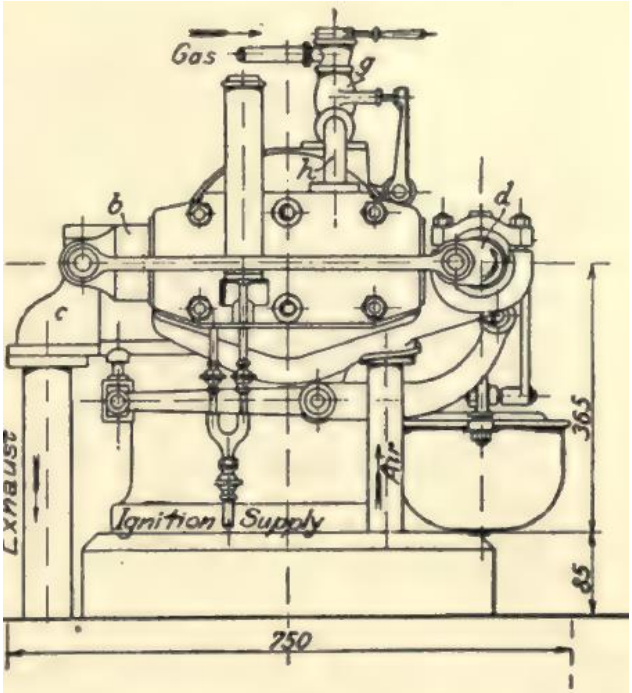


FIG. 11–20. — End View of Otto Engine of 1884.

[0096]. Apparatus is also used as a **"suction gas apparatus"** for a marine propulsion system/engine. Ex. 1021, pp. 366-367.

[0097]. Apparatus is also used as an **"ignition apparatus."** Ex. 1011, p. 394. As shown in Figures 11-5 and 13-3 (see below), the ignition apparatus is a device that includes multiple components to provide ignition in the engine combustion chamber: "Ignition by Hot Tube. — The simplest form of the hot tube ignition apparatus has already been shown in Fig. 11-5 Chapter XI. It consists merely of a small tube 3 or 4 inches long, of steel, porcelain, or platinum. The open end of this tube is in communication with the combustion chamber, the other end is closed." *Id.*

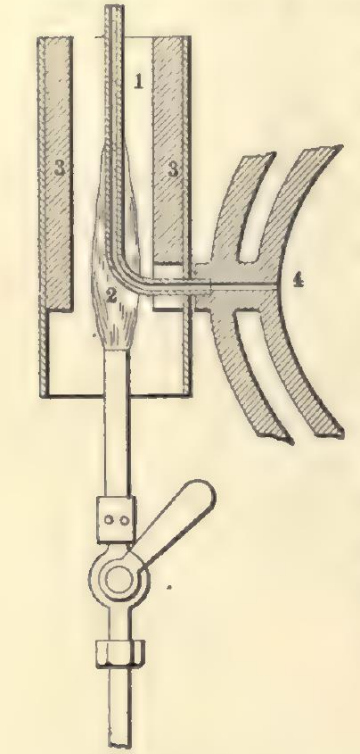


FIG. 11–5. — Newton's Hot Tube Igniter.

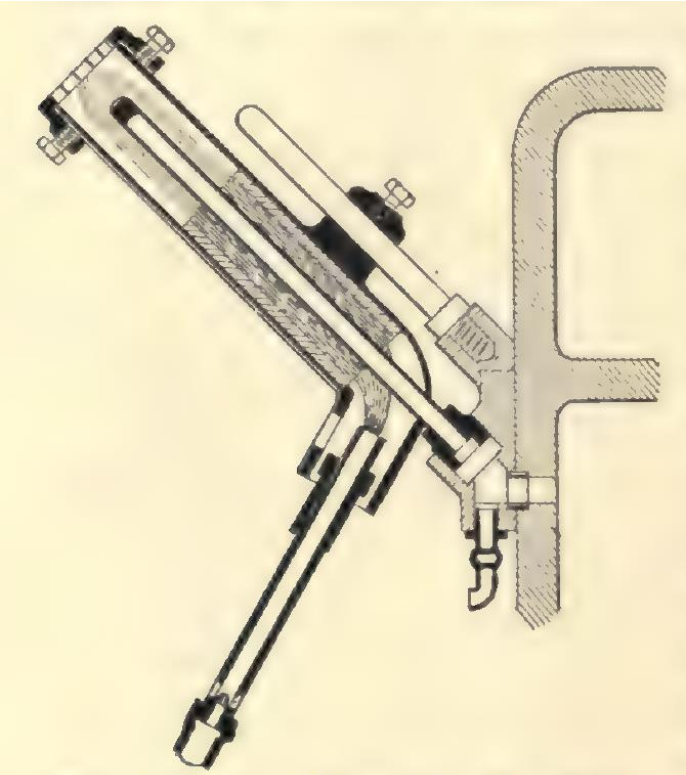


FIG. 13–3.—Adjustable Hot Tube.

[0098]. As shown in Figure 13-7 (below), the whole system is referred to as a Make-and-Break Ignition Apparatus. Moreover, the figure further makes clear that "apparatus" includes different components to provide ignition and timing control of ignition. *Id.*

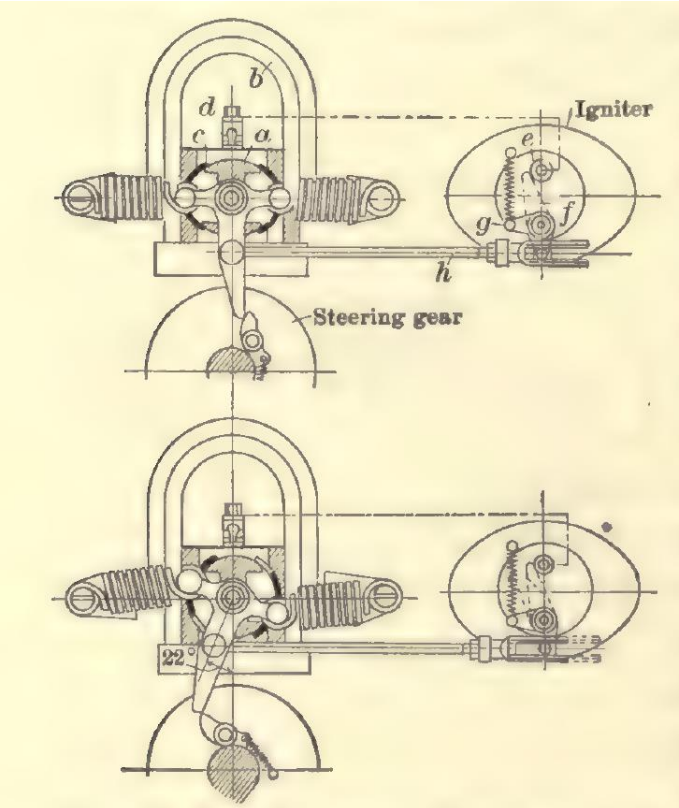


FIG. 13–7.—Make-and-Break Ignition Apparatus.

[0099]. Apparatus is also used as a **"starting apparatus."** Ex. 1021, p. 428. Figure 13-38 (shown below) illustrates an "Air-starting Apparatus." *Id.*

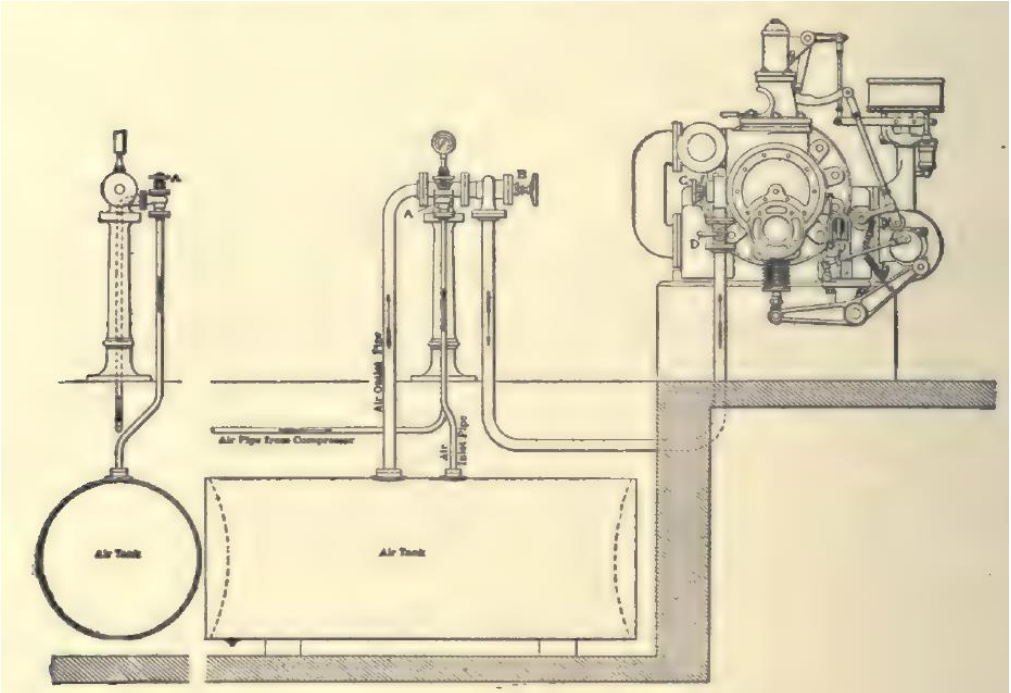


FIG. 13–38. — Air-starting Apparatus.

[0100]. The apparatus in Figure 13-38 includes multiple valves: gas (air) flow control valve A, gas shut-off (stop) valve B, and plug valve D that is inserted in the air pipe immediately ahead of the inlet valve. *Id.* A is the valve controlling the flow of air from a separately driven air compressor to the tank and B a similar valve in the pipe connecting the tank to the engine. *Id.* Both valves are mounted on one pillar, which also has screwed on top of it a gage indicating continuously the pressure in the tank. *Id.* Regulation of the supply of compressed air to the engine cylinder is affected by means of an automatic spring-loaded inlet poppet valve, the stem and disc of which may be released or held fast by screwing down or unscrewing the hand wheel C at the engine end of the air pipe. *Id.* A plug

valve D is inserted in the air pipe immediately ahead of the inlet valve. *Id.* Before starting the engine, the flywheel is turned into such a position that the crank is about 30 degrees above the inner dead center." *Id.* The valve D is run by turning the handle D 90 degrees. *Id.*

[0101]. Apparatus is also used as a **"heating apparatus"** that consumes fuel. Ex. 1021, p. 482. A "dead weight testing apparatus." Ex. 1021, p. 490. An "apparatus with which the electrical measurements are executed must be calibrated before and if possible [,] also after the test." Ex. 1021, p. 520.

[0102]. Apparatus is also used as a **"cooling apparatus."** Ex. 1021, p. 561.

[0103]. In *Internal Combustion Engines* the term "apparatus" is used as a **"flow apparatus"** for the system to measure and understand the reactions in the end gas of the combustion chamber of an engine. Ex. 1022, p. 106.

[0104]. *Internal Combustion Engines* also uses the term "apparatus" for the setup for photographing the combustion process. Ex. 1022, pp. 189-190. The setup is shown in Figure 1.19 (see below).

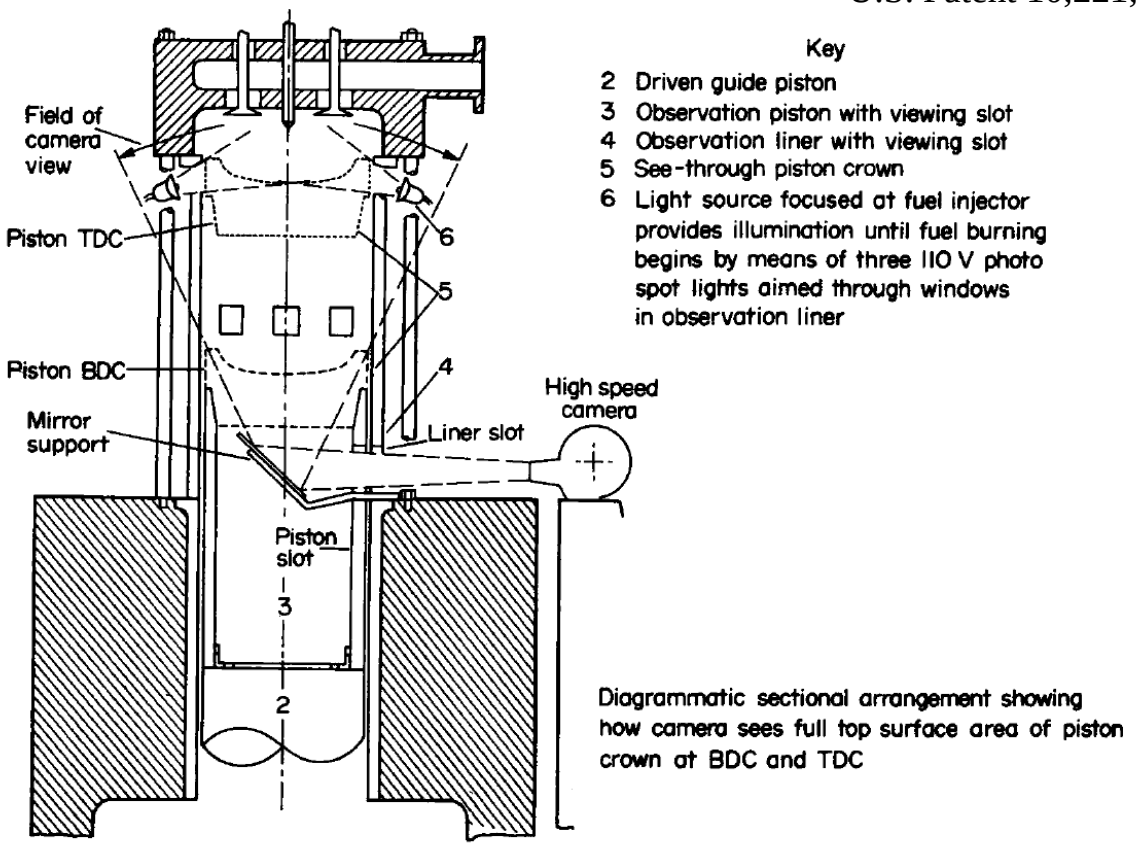


FIG. I.19. Diagrammatic arrangement for indirectly photographing combustion phenomena.

[0105]. Apparatus is also used as an **"Orsat Apparatus"** for the whole system to analyze exhaust gases from an engine. Ex. 1022, p. 190.

[0106]. *Internal Combustion Engines* also uses the term apparatus to describe an experimental setup built for a fuel droplet study. "Nishiwaki built an apparatus in which a droplet of fuel, suspended on a thin filament of silica, could suddenly be plunged into an environment of high temperature air." Ex. 1015, p. 131. As shown in Figure 27 (see below), the term apparatus is also used to describe a setup that is used for flow visualization in engine design.

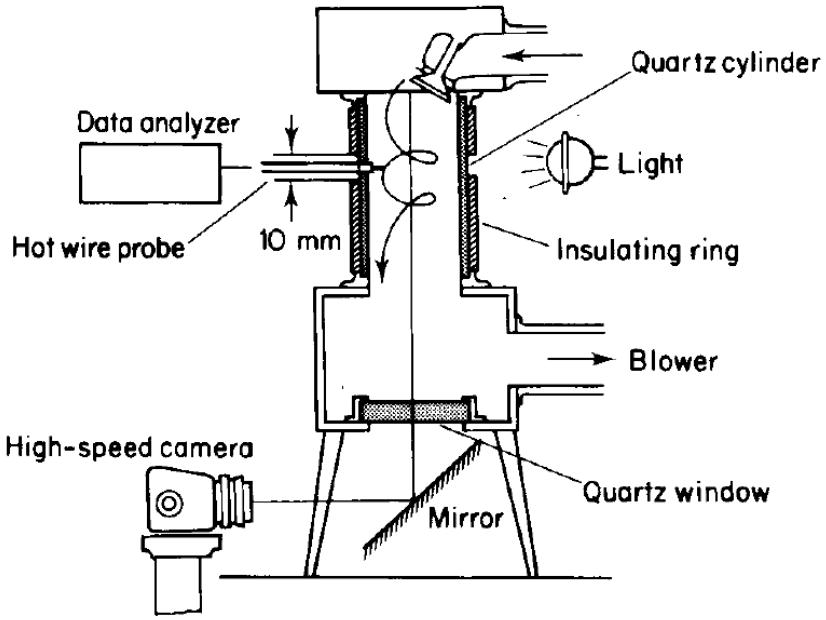
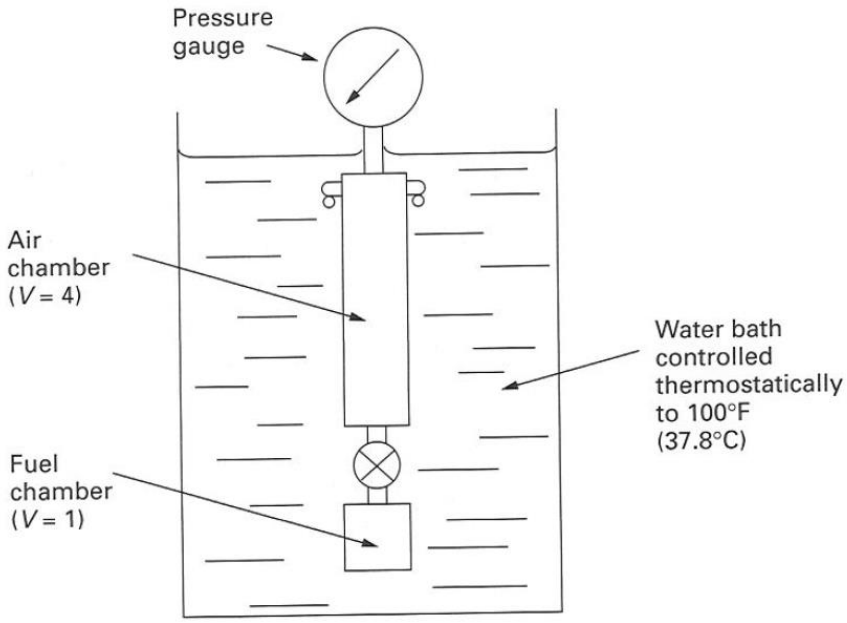


Figure 27 Experimental apparatus for gas flow study in cylinder by high speed photography and hot wire anemometry (Matsushita *et al.*, 1985).

[0107]. *Introduction to Internal Combustion Engines* uses the term apparatus for a **"[r]eid vapor pressure apparatus."** Ex. 1020, p. 78. As shown in Figure 3.12 (see below), the setup comprises different chambers, a valve, and a pressure gauge. *Id.* The setup is designed to measure an engine fuel volatility property, known as reid vapor pressure (RVP), that affects engine start-ability during cold/winter seasons.

Figure 3.12
Reid vapour pressure apparatus (from Goodger, 1975).



[0108]. *Introduction to Internal Combustion Engines*, further describes that "[t]he **Reid apparatus**…consists of a fuel chamber connected to an air chamber." *Id.*

[0109]. In Chapter 16, of *Engine Testing Theory and Practice* the term **"emissions apparatus"** is used to refer to physical techniques and instruments that are required to measure engine exhaust emissions. Ex. 1012, p. 340.

[0110]. Chapter 18 uses the term "apparatus" as a variety of testing equipment such as brake tester, chassis dynamometers, and related equipment (e.g., safety, detectors, loading and emergency brakes) required for vehicle testing. *Id.*, 368-394. Chapter 18 discloses that "[i]n this chapter, an attempt has been made to survey the whole range of apparatus that may be described by the general heading

of rolling roads/chassis dynamometers, from the simple garage brake tester to complex and very costly climatic chambers and anechoic cells." *Id.*

[0111]. An apparatus is also used as an **"electronic apparatus"** for the electronic equipment in the test room that generates heat and cause a moderate heating load. Ex. 1013, p. 94.

[0112]. *Combustion Engines Development* uses the term "apparatus" as a special **"test apparatus"** in describing Figure 3.14 (see below). Ex. 1019, p. 56. *Combustion Engines Development* discloses that "the test apparatus shown in Fig. 3.14 above (Glaser 1983) is employed, which makes it possible to subject an unstressed pressure sensor to a cyclical heating of similar size and frequency as arise in the engine. *Id.* The test apparatus includes a sensor, a radiant heat surface and a rotating diaphragm wheel. *Id.*

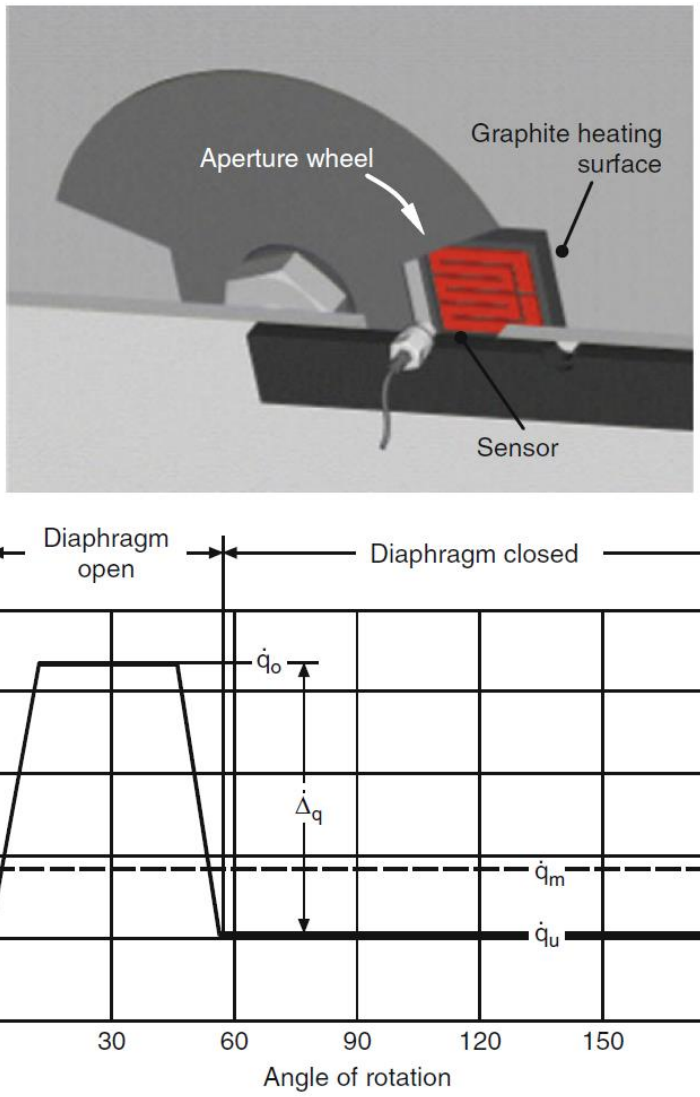


Fig. 3.14 Dynamic test apparatus to determine cyclical temperature drift

[0113]. *Combustion Engines Development* further discloses an **"exhaust apparatus"** for the exhaust system of an engine when describing the required changes for adding a supercharger to an engine. Ex. 1019, p. 318.

[0114]. An "apparatus" is also used as a **"guide apparatus"** for the setup to guide exhaust gas flow of an engine turbocharger to minimize flow dynamic losses. Ex. 1019, p. 324.

[0115]. *Combustion Engines Development* further discloses that "[n]early all modern turbocharged car diesel engines have charge pressure control using an **adjustable guide apparatus**." Ex. 1019, p. 327.

[0116]. *Alternative Transportation Fuels* uses the term "apparatus" for setups designed to measure properties of fuels for engines. For example, a Saybolt Viscometer, which consists of a standard cylindrical oil cup surrounded with a water bath with an immersion heater and a stirring device as shown in Figure 6.3. Ex. 1016, p. 321.

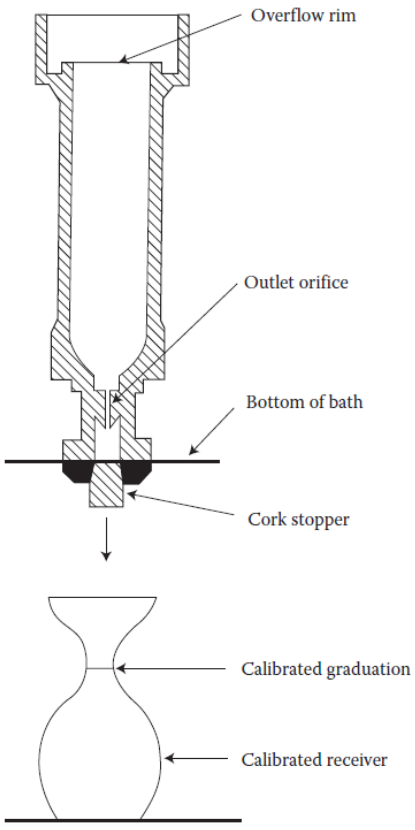


FIGURE 6.3
Saybolt viscometer.

[0117]. *Alternative Transportation Fuels* also discloses "[a]n Ables apparatus is used to determine the flash point that is shown in Figure 6.4." Ex. 1016, pp. 323-324.

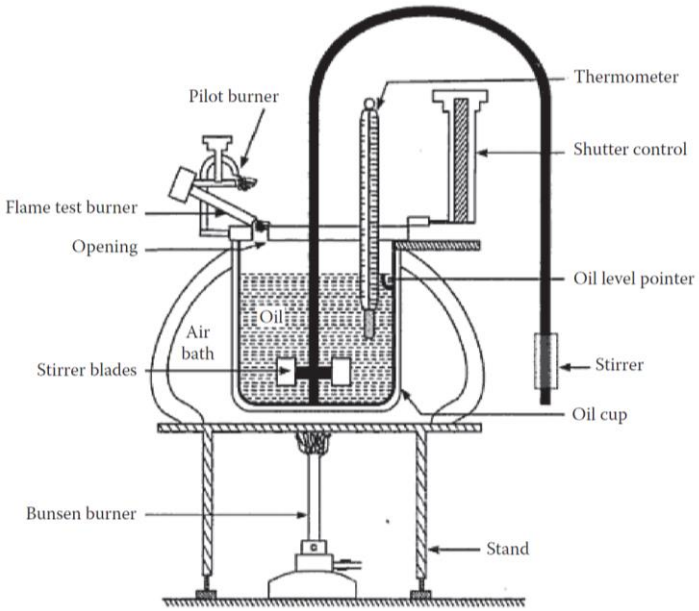


FIGURE 6.4
Ables apparatus.

[0118]. Moreover, *Alternative Transportation Fuels* discloses an apparatus comprising a cylindrical glass test for measuring cloud and pour points in Figure 6.5 (shown below). Ex. 1016, p. 325.

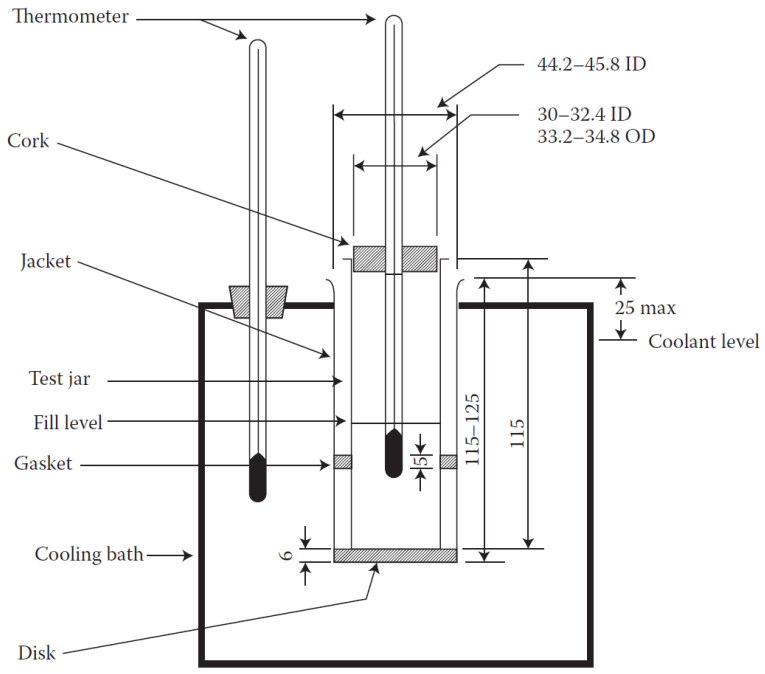


FIGURE 6.5
Apparatus for measuring cloud point and pour point.

B. The Claimed Terms "Coupled," "Prevent…Coupling" and "Permit…to Couple"

Claim 1 of the '780 Patent recites:

> [A] fuel lockout apparatus **coupled** to the mechanical fuel valve…[and] configured to: **prevent** the second fuel source from **coupling** to the second fuel line while the mechanical fuel valve is in the first position; and **permit** the second fuel source **to couple** to the second fuel line while the mechanical fuel valve is in the second position.

[0119]. In looking to the specification, a POSA would have understood that the terms "prevent…coupling" and "permit…to couple" to mean "prevent…attaching" and "permit…to attach." The terms "coupling" and "to couple" refer to physically connecting or attaching two items. Ex.1022, p.4.

[0120]. As it was with the term "fuel lockout apparatus," the specification of the '780 Patent is the best guide for ascertaining what a POSA would have understood the terms "prevent…coupling" and "permit…to couple" to mean.

1. "Prevent…Coupling" and "Permit…Coupling" as Recited in the Specification.

[0121]. The specification of the '780 Patent discloses only one way in which the fuel lockout apparatus "prevent[s]…coupling" of the second fuel source to the second fuel line: the "flange" (item 61) of the fuel lockout apparatus "block[s] fuel inlet 59 to ***prevent coupling*** the first end 50 a and second end 50 b of the quick-disconnect hose coupling ***together***." Ex.1001, 7:60-63; Figs. 2, 4A; *see also id.* 5:52-64, 6:10- 31. FIGS. 2 and 4A illustrate this:

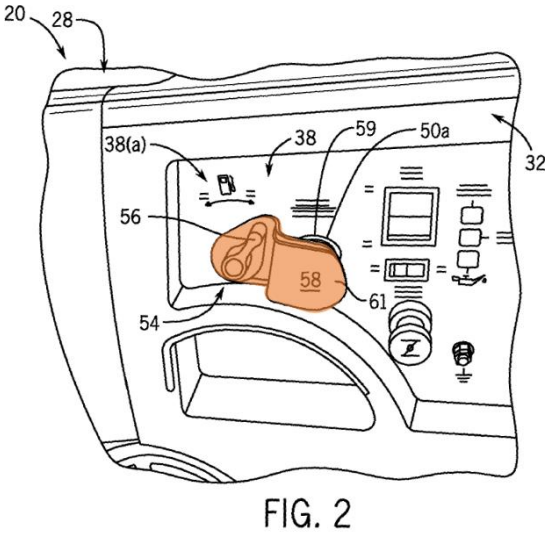


FIG. 2

Ex.1001, FIG. 2 (Emphasis Added).

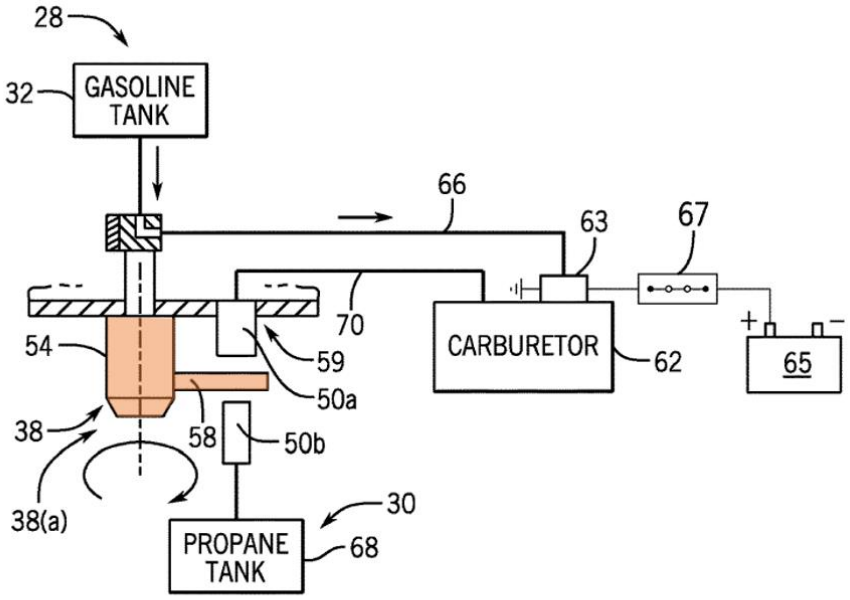


FIG. 4A

Ex.1001, FIG. 4A (Emphasis Added).

[0122]. The specification of the ‘780 Patent also discloses only one way in which the fuel lockout apparatus “permits” the second fuel source “to couple” to the second fuel line: “flange” (item 61) “unblock[s] fuel inlet 59 to permit attaching first end 50a and second end 50b together.” Ex.1001, 7:63-67; Figs. 3, 4B; *see also id.* 6:32-41, 8:38-48. FIGS. 3 and 4B illustrate this:

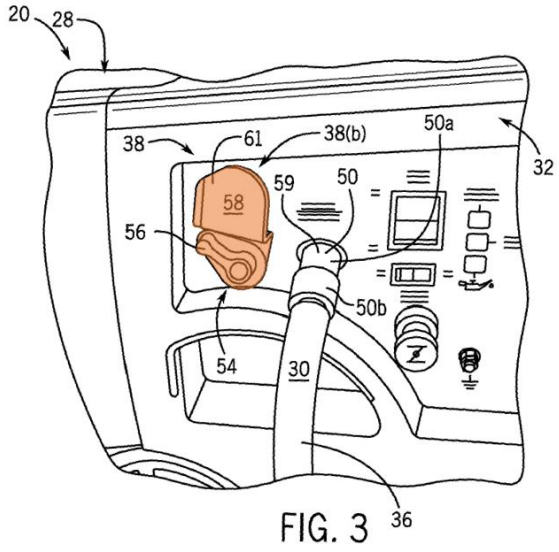


FIG. 3

Ex.1001, FIG. 3 (Emphasis Added).

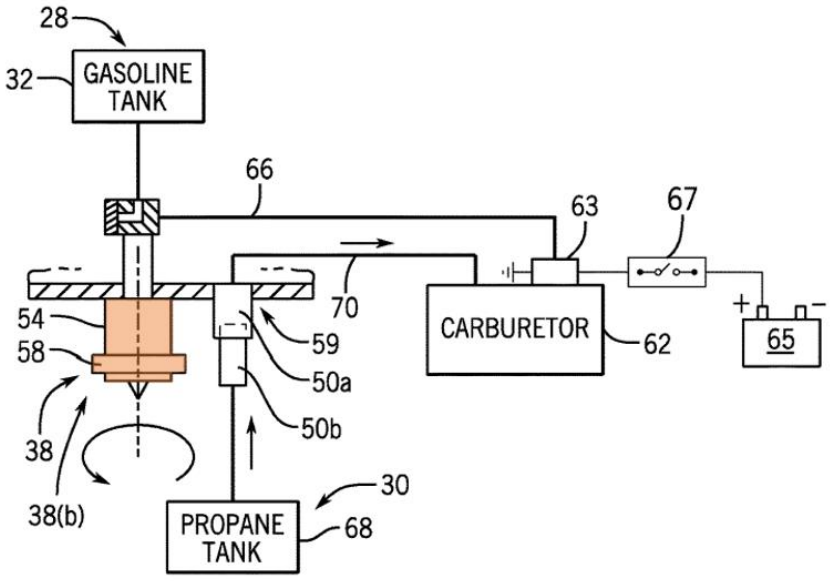


FIG. 4B

Ex.1001, FIG. 4B (Emphasis Added)

[0123]. Therefore, a POSA would have understood the terms "prevent…coupling" and "permit…to couple" to mean "prevent…attaching" and

"permit…to attach," respectively. This construction finds ample support in the specification of the '780 Patent.

[0124]. In addition, during patent prosecution, the Examiner stated that the original dependent claim 3 would be allowable if presented as an independent claim based on the understanding that the "fuel lockout apparatus prevent[s] the second fuel source from coupling to the second fuel line…mean[ing] that not only are the two not in fluid communication but they are not physically connected in any manner." Ex. 1002, p. 160. In his reasoning, the Examiner stated that the prior art Champion Manual "discloses a dual fuel system as discussed…but its lockout switch does not prevent the hose of the propane tank from even coupling to the engine fuel system lines." *Id.* The Examiner thus interpreted the term "coupling" to require not only "fluid communication," but "physical[] connect[ion]."

[0125]. In addition, the *American Heritage Dictionary of the English Language* defines couple as "something that joins or connects two things together: a link." Ex. 1014, p.4. A POSA would have therefore understood the terms "prevent…coupling" and "permit…to couple" to mean "prevent…attaching" and "permit…to attach," respectively.

i.-a Use of the Terms "coupled", and "coupling" in Internal Combustion Engine and Mechanical Engineering Literature

[0126]. The construction of **"coupled"** and **"coupling"** as **"to attach"** is aligned with how the terms have been used in internal combustion engine (ICE) literature. Some examples of using the terms **"coupled"** and **"coupling"** as "**attach**" include "**coupled mechanically**" and "**coupled hydraulically"** or "**fluid coupled."** In forming my opinion, I have reviewed the following ICE literature:

- John B. Heywood, *Internal Combustion Engine Fundamental*s (McGraw-Hill 1988).
- Richard Stone, *Introduction to Internal Combustion Engines* (3d ed. 1999).
- Constantine Arcoumanis, *Internal Combustion Engines* (Academic Press 1988).
- A.J. Martyr & M.A. Plint, *Engine Testing: Theory and Practice* (3d ed. 2007).
- Lino Guzzella & Christopher H. Onder, *Introduction to Modeling and Control of Internal Combustion Engine Systems* (2010).
- Inst. of Mech. Eng'rs, *Internal Combustion Engines: Performance, Fuel Economy and Emissions* (2013).
- Carsten Baumgarten, *Mixture Formation in Internal Combustion Engines* (2006).

- Richard van Basshuysen & Fred Schäfer, *Internal Combustion Engine Handbook* (SAE Int'l 2004).
- Horst Bauer, *Bosch Gasoline-Engine Management: Basics and Components* (2001).
- Hua Zhao, *HCCI and CAI Engines for the Automotive Industry* (CRC Press 2006).
- Günter P. Merker, Christian Schwarz & Rüdiger Teichmann, *Combustion Engines Development* (2012).
- Eugene A. Avallone, Theodore Baumeister III & Ali M. Sadegh, *Marks' Standard Handbook for Mechanical Engineers* (11th ed. 2007).
- K.K. Ramalingam, *Handbook of Mechanical Engineering Terms* (2d ed. 2009).
- Thomas G. Beckwith, N. Lewis Buck & Roy D. Marangoni, *Mechanical Measurements* (3d ed. 1982).
- Myer Kutz, *Mechanical Engineers' Handbook* (2d ed. 1986).
- A. Parrish, *Mechanical Engineer's Reference Book* (Butterworth & Co. Publ'rs 1973).

- Rowland S. Benson & N.D. Whitehouse, *Internal Combustion Engines* (Pergamon Press 1979).
- Alexander A. Stotsky, *Automotive Engine Control, Estimation, Statistical Detection* (Springer 2009).

[0127]. Examples of "**coupled mechanically**" and "**coupled hydraulically"** or "**fluid coupled."** are provided below.

i.-a Coupled "Mechanically"

[0128]. **Mechanical coupling** is referred to rigid coupling including but not limited to couplings via gears, shafts, flanges, and stiff rubbers. In this case, movement of an object is linked/coupled to the movement of another object. Some examples are included in the followings.

[0129]. *Bosch Gasoline-engine Management Basics and Components* discloses that "[i]n conventional IC engines, camshaft and crankshaft are **mechanically coupled** to each other through toothed belt or chain. The valve opening period and lift are not affected by camshaft phase adjustment, which means that 'intake opens' and 'intake closes' remain invariably coupled with each other." *See* Ex. 1011, p. 22.

[0130]. *Engine Testing: Theory and Practice*, mentions various forms of **mechanical couplings** such as **shaft coupling**, **flange coupling**, **stiff rubber coupling** to connect an engine to a dynamometer. *See* Ex. 1012, pp. 170-196.

[0131]. *Mechanical Engineer's Reference Book* explains different types of couplings including **mechanical couplings** with gears, shafts, rubbers, flanges, etc. It classifies couplings to "rigid" and "flexible" or "soft" types, among others. Ex. 1017, pp. 13-2, 13-3.

[0132]. *Mixture Formation in Internal Combustion Engines* discloses that "[t]he second main group of high-pressure injection systems are those in which the generation of injection pressure and the injection itself occur synchronously. These systems are driven by a camshaft, which is **mechanically coupled** with the engine." *See* Ex. 1018, p. 34.

[0133]. *Combustion Engines Development* discloses that "in the case of mechanical supercharging, a charging aggregate mounted on the engine is usually powered by a belt or gearwheel drive, which is why the engine and compressor speeds are usually rigidly coupled." *See* Ex. 1019, p. 313.

[0134]. *Engine Testing: Theory and Practice* also discloses that a "[m]anifold is coupled to a flexible stainless steel pipe, of fairly large diameter to minimize pressure waves, and led by way of a back pressure regulating valve to a pipe system suspended from the cell roof." *See* Ex. 1012, p. 123.

[0135]. *Introduction to Internal Combustion Engines,* discloses that "[t]he injection pump is **directly coupled** to the engine (half engine speed for a

four-stroke engine) and [that] the pump controls the quantity and timing of the fuel injection (figure 5.12)." Ex. 1020, p. 232.

i.-b. Coupled "Hydraulically" or "by Fluid"

[0136]. Hydraulic coupling or coupling via fluids is referred to coupling that is established based on fluid connection between two channels, sources, or objects. The fluid can be oil, coolant, or liquid fuel, but it is not limited to these fluids. The fluid channels will be connected/coupled via fluid pressure and it will include both positive pressures and negative pressures (e.g., vacuum lines). Examples of how fluid couplings are mentioned in the literature are provided below:

[0137]. *Handbook of Mechanical Engineering Terms* discloses "[a] liquid coupling used to transmit the engine effort (torque) to a clutch and transmission. This coupling is always a major part of the engine flywheel." See Ex. 1023, p. 314.

[0138]. *Mechanical Engineer's Reference Book* discloses "Hydrokinetic or Fluid Couplings for transmitting power due to the kinetic energy transfer in a fluid filling operation." See Ex. 1017, pp. 13-3.

[0139]. *Mixture Formation in Internal Combustion Engines* discloses a "assembly consist[ing] of a piezo stack, a hydraulic coupling device, a control valve, and the nozzle module. The hydraulic coupling device amplifies the

elongation of the piezo stack and transfers it to the control valve." See Ex. 1018, p. 234.

[0140]. *Combustion Engines Development* discloses that a "flow-type coupling of both sub-components results in a significantly delayed torque build-up compared with the steady-state behavior of the engine." See Ex. 1019, p. 330.

VII. THE CHALLENGED CLAIMS ARE UNPATENTABLE BASED ON THE PRIOR ART

A. Ground 1: The Combination of DuroMax and Elsdon Renders Obvious Claims 1, 2, 3, 4, 6, 7 and 15.

[0141]. As explained in §§VII.A.1-7, claims 1, 2, 3, 4, 6, 7 and 15 of the '780 Patent are obvious under §103, as detailed below.

1. Independent claim 1

a. Element [1.0]: "A mechanical fuel lockout switch for a dual fuel engine comprising:"

[0142]. The combination of DuroMax and Elsdon discloses element 1.0. DuroMax discloses a dual fuel generator in which either LPG or gasoline may be selected for operation of the generator. Ex.1004, pp.11-12. DuroMax also discloses a mechanical fuel valve coupled to the internal combustion engine. Ex. 1004, p.20.

[0143]. Elsdon discloses a fuel conduit coupler cap 12 and shield 14. Ex.1005, 4:1-5. As discussed hereafter in §§VII.A.1.a.1-2, it is my opinion that a

POSA would have understood it to be obvious to combine the Elsdon fuel conduit coupler cap with the gasoline valve of DuroMax to provide a mechanical fuel lockout switch and prevent unstable operating conditions, such as where both fuels are simultaneously delivered to the generator engine.

1. Motivation to Combine DuroMax and Elson

[0144]. DuroMax discloses a dual fuel generator that is configured to operate on both LPG and gasoline fuel sources. Ex. 1004, pp.11-12.

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

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

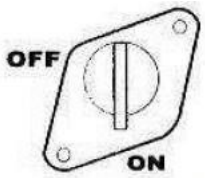


Figure 6 - fuel valve in the "on" position

Ex.1004, p.11.

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

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

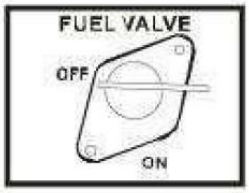


Figure A - Fuel Valve in the "OFF" position

Ex.1004, p.12.

[0145]. DuroMax discloses that the generator includes a gasoline fuel tank with a mechanical fuel valve that stops gasoline fuel from exiting the gasoline tank and being delivered to the generator engine when run on LPG fuel. Ex.1004, p.12.

[0146]. DuroMax discloses a fuel valve having an "on" and "off" position. Ex. 1004, pp. 11-12.

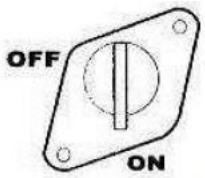


Figure 6 - fuel valve in the "on" position

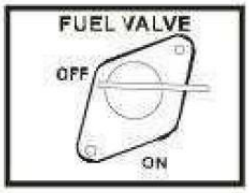


Figure A - Fuel Valve in the "OFF" position

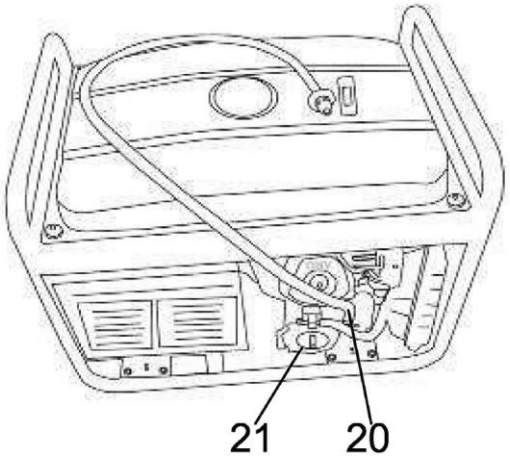
Ex.1004, pp.11,12.



Figure 19 –Removing the Fuel Filter Cup

Ex.1004, p.20 (Emphasis Added).

[0147]. DuroMax also discloses an onboard LPG tank connector which couples to an LPG hose of an external LPG tank for delivering LPG fuel to the generator engine when run on LPG fuel. Ex. 1004, p.7.



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

Ex.1004, pp.7-8.

[0148]. A POSA would understand that while DuroMax can run on either gasoline fuel or LPG fuel, DuroMax is not configured to run on both fuel sources at the same time.

[0149]. 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!

Ex.1004, p.11.

[0150]. This is consistent with the background section of the '780 Patent, which discloses that prior art dual fuel engines "can experience overly rich air-fuel ratio when both fuels are simultaneously engaged" which can "make the engine hard to start or lead to unstable operating conditions." Ex.1001, 1:48-55. *See Qualcomm Inc. v. Apple Inc*., 24 F.4th 1367, 1375 (Fed. Cir. 2022) ("'[I]t is appropriate to rely on admissions in a patent's specification when assessing whether that patent's claims would have been obvious' in an *inter partes* review proceeding."); *see also* USPTO, Updated Guidance on the Treatment of Statements of the Applicant in the Challenged Patent in Inter Partes Reviews under §311, at 4 (June 9, 2022).

[0151]. Elsdon discloses a cap and shield assembly for covering a fluid conduit (i.e., a fuel line). Ex.1005, 3:3-14. Elsdon discloses that by rotating the cap 14 over the conduit coupler 12, the cap 14 prohibits access to the coupler interface, thereby preventing connecting of a hose with the coupler interface. Ex. 1005, 3:3-14, 5:1-10.

[0152]. Elsdon explicitly recognizes the importance of properly sequencing the connection of fuel sources with the opening of associated valves. For example, Elsdon notes that it may be important to ensure the closing or opening of fuel valves before permitting coupling or uncoupling to the connection interface. Ex.1005, 1:23-40. Elsdon discloses that its cap and shield may be

utilized in such sequenced interconnected valve and coupler arrangements. Ex.1005, 4:44-53.

[0153]. 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. Specifically, a POSA would have been motivated to connect the Elsdon fuel conduit coupler cap to the mechanical fuel valve of DuroMax to restrict access to the LPG hose connector interface of DuroMax when the DuroMax generator is running with gasoline fuel.

[0154]. 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.

[0155]. A POSA would have understood such an arrangement to prevent simultaneous use of LPG and gasoline, which was a known problem with generators such as DuroMax.

2. Reasonable Expectation of Success in Combining DuroMax and Elson

[0156]. A POSA would have had a reasonable expectation of success in implementing the fuel conduit coupler cap of Elsdon onto the LPG fuel conduit coupler of DuroMax. Elsdon emphasizes that its cap assembly may be "retrofit" to

cover existing fuel couplers on "construction equipment" such as a generator. Ex. 1005, 2:27-32; 5:11-14. Elsdon utilizes a simple connection arrangement, in which the cap 16 rotates around the axis of the shaft 18.

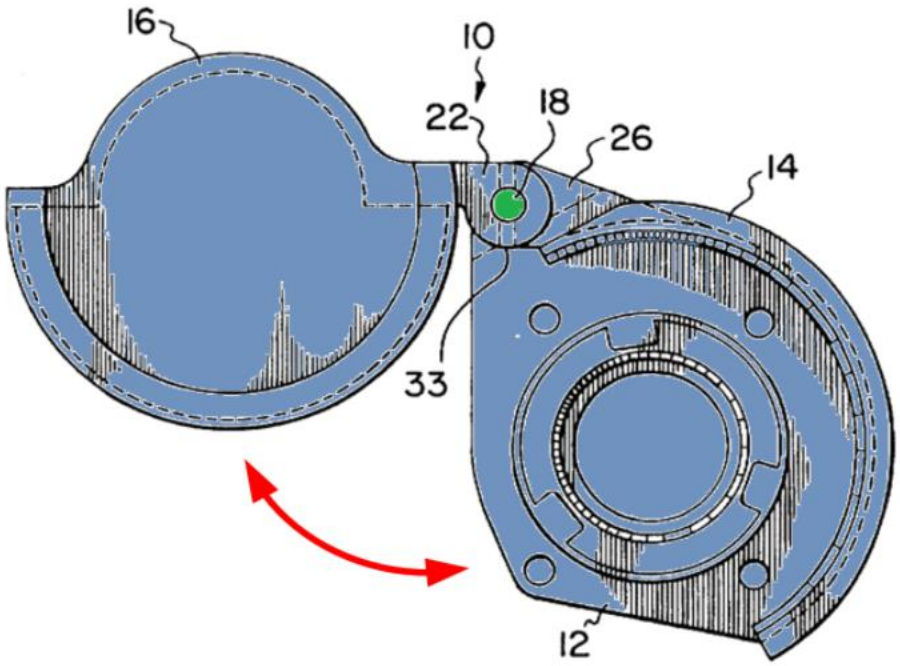


FIG. 1

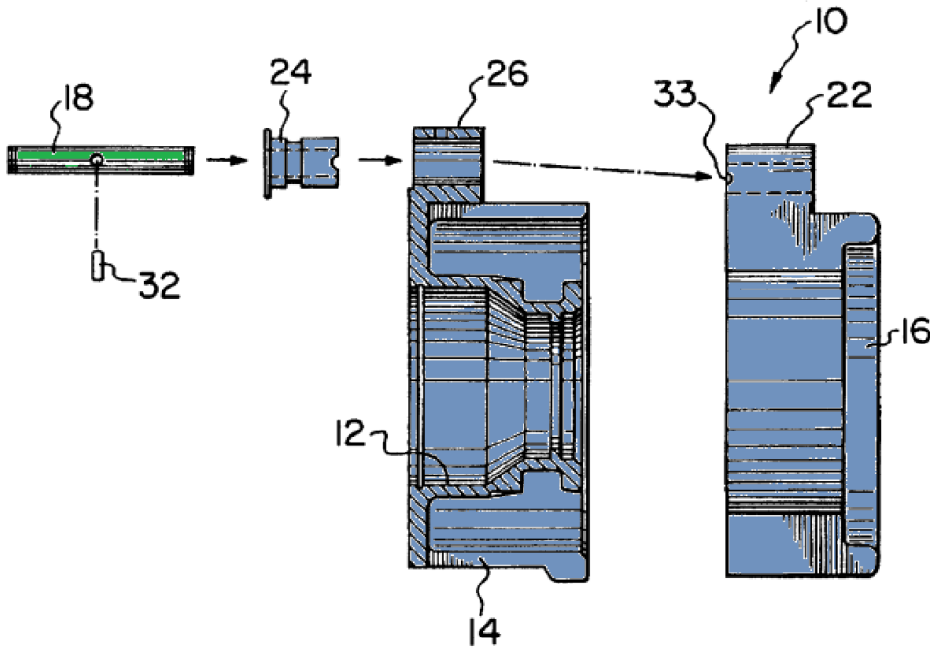


FIG. 3

[0157]. A POSA would have understood that the fuel valve of DuroMax is a simple shut off mechanical fuel valve utilizing a valve handle that rotates a shaft (e.g., valve stem) connected to a stop (e.g., valve seat) inside of the valve body for preventing fuel flow.

[0158]. A POSA would have also understood that the valve handle and shaft of the DuroMax fuel valve could be readily connected to the cap 16 of Elsdon such that the DuroMax valve handle and shaft rotate together with the Elsdon cap 16.

[0159]. A POSA would have further understood that the fuel valve and LPG fuel conduit coupler of DuroMax could easily be moved to different positions

on the generator such that the two components are located immediately next to each other.

[0160]. For example, as disclosed in the YouTube video (Ex. 1010), it was well known in the art that the LPG inlet connector on a portable generator can be easily moved around the generator. Ex.1010, 15:39-16:20. A POSA would understand that the propane inlet port can be installed on any side of the generator accessible to the operator (e.g., the same side as a gasoline valve), so long as the propane inlet port does not interact with hot exhaust gases.

[0161]. Accordingly, a POSA would have understood that the cap 16 of Elsdon can rotate with the valve handle of the DuroMax fuel valve to cover the LPG fuel conduit coupler when the DuroMax mechanical fuel valve is open, and can rotate to permit access to the LPG fuel conduit coupler when the DuroMax mechanical fuel valve is closed.

b. Element [1.1]: "a mechanical fuel valve actuateable between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line; and"

[0162]. DuroMax discloses a mechanical fuel valve coupled to the internal combustion engine. Ex.1004, p.11-12.

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

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

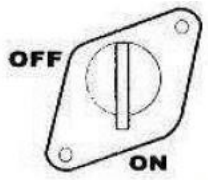


Figure 6 - fuel valve in the "on" position

Ex.1004, p.11.

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

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

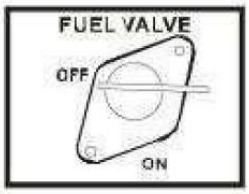


Figure A - Fuel Valve in the "OFF" position

Ex.1004, p.12.

[0163]. Elsdon discloses a fuel conduit coupler shield 14 and cap 16 that when closed prevents connection of a fuel source. Ex. 1005, 3:3-14. Elsdon discloses that by rotating cap 16 over conduit coupler 12, cap 16 prohibits access to the coupler interface, thereby preventing connecting of a hose with the coupler interface. *Id.*, 3:3-14, 5:1-10.

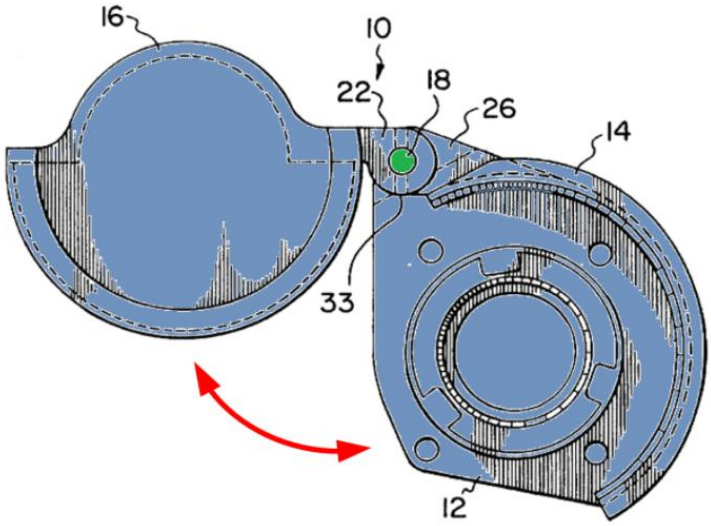


FIG. 1

Ex.1005, FIG. 1 (annotated).

[0164]. It would have been obvious to a POSA to combine the Elsdon fuel conduit coupler cap with the mechanical fuel valve of DuroMax to provide a mechanical fuel valve that both controls the flow of gasoline from the tank through the gasoline line (as disclosed by DuroMax) and simultaneously rotates to block and unblock the LPG inlet (as disclosed by Elsdon).

[0165]. 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 '780 Patent.

c. Element [1.2]: "a fuel lockout apparatus coupled to the mechanical fuel valve;"

[0166]. As noted above, the "fuel lockout apparatus" is properly construed as a means plus function term covering items 58, 61 in Figs. 2, 3, 4A, 4B, as described at Ex. 1001, 5:37-64; 6:10-31; 6:42-7:17; 7:54-67; 8:49-64 and equivalents thereof. *Supra* §VI.A.

[0167]. As noted above, it would have been obvious to have connected the valve handle and shaft of the DuroMax fuel valve to the 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 out 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. Thus, the combination of DuroMax and Elston teaches a "fuel lockout apparatus."

d. Element [1.3]: "wherein the mechanical fuel lockout switch: communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position; and"

[0168]. 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).

[0169]. As noted above, a POSA would have found it obvious to have connected the valve handle and shaft of the DuroMax fuel valve to the cap 16 of Elsdon to prevent the simultanious flow of gasoline and LPG fuel to the dual fuel engine. *Supra* §§VII.A.1.a.1-2.

[0170]. Specifically, A POSA would have found it obvious to connect these components that the 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. *See supra* §§VII.A.1.a.1-2.

e. Element [1.4]: "wherein the fuel lockout apparatus is configured to: prevent the second fuel source from coupling to the second fuel line while the mechanical fuel valve is in the first position; and permit the second fuel source to couple to the second fuel line while the mechanical fuel valve is in the second position."

[0171]. As explained above, it would have been obvious to have connected the valve handle and shaft of the DuroMax fuel valve to the cap 16 of Elsdon so that the cap 16 covers the LPG fuel conduit coupler when the mechanical fuel valve is in the open (first) position and to uncover the LPG fuel conduit coupler when the mechanical fuel valve is in the closed (second) position. *Supra* §VII.A.1.d.

[0172]. A POSA would have undertstood that when covering the LPG fuel conduit coupler, the cap 16 would prevent the LPG hose from coupling to the LPG fuel conduit connector. A POSA would also understand that when uncovering the LPG fuel conduit connector, the cap 16 would permit the LPG hose to couple with the LPG fuel conduit connector.

2. Claim 2: "The mechanical fuel lockout switch for a dual fuel engine of claim 1, wherein the fuel lockout apparatus prevents actuation of the mechanical fuel valve to the first position when the second fuel source communicates with the dual fuel engine."

[0173]. The combination of DuroMax and Elsdon teaches claim 2. The combination of DuroMax and Elsdon discloses a fuel lockout apparatus coupled to a mechanical fuel valve. *Supra,* §VII.A.1.c.

[0174]. Elsdon discloses a fuel lockout apparatus comprising a cap and shield. *Supra,* §VII.A.1.c. As seen in FIG. 1 (below), when the cap is in the open

position the second fuel source (LPG) may be communicated to the internal combustion engine.

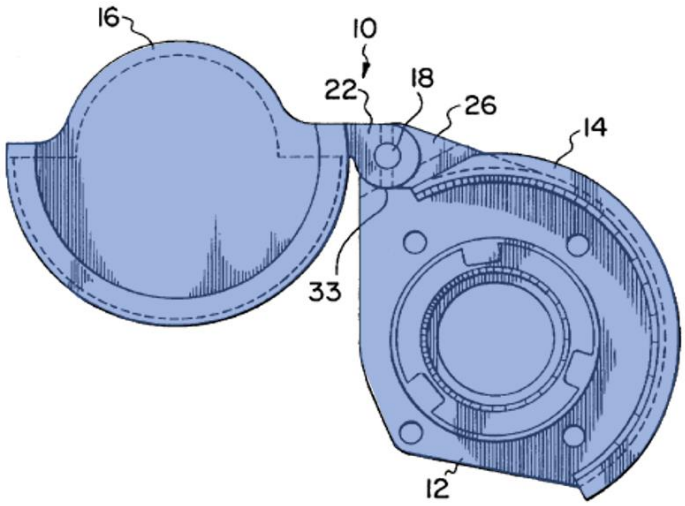


FIG. 1

Ex.1005, FIG. 1 (Emphasis Added).

[0175]. As shown in FIG. 2 (below), when the cap is in the closed position, the second fuel source (LPG) is prevented from being communicated with the internal combustion engine.

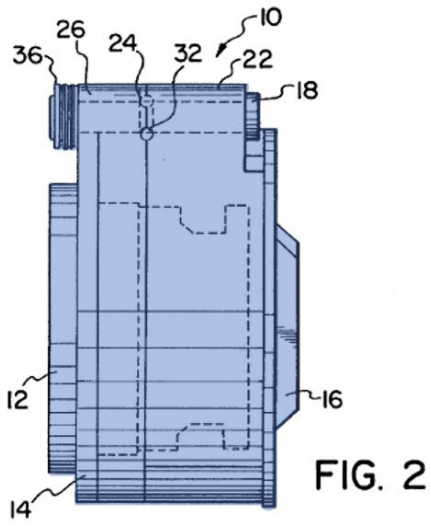


FIG. 2

Ex.1005, FIG. 2 (Emphasis Added).

[0176]. As described in §VII.A.1.e, *supra,* a POSA would have understood that operation of the mechanical fuel valve and the fuel lockout apparatus is interconnected such that only one fuel can be communicated to the engine at one time.

[0177]. Specifically, the mechanical fuel valve of DuroMax would be rigidly connected to the cap of Eldson such that when the gasoline valve is rotated into a closed position, the cap of Eldson is moved into the open position and when the gasoline valve is rotated into an open position, the cap of Eldson is moved into the closed position.

[0178]. A POSA would have therefore understood that when the fuel lockout apparatus of Elsdon is interconnected with the mechanical fuel valve of

DuroMax, the mechanical fuel valve would be prevented from moving into the first position when the second fuel source communicates with the dual fuel engine (due to the cap coming into contact with the LPG input line).

[0179]. Accordingly, a POSA would have understood that the combination of DuroMax and Elsdon teaches claim 2.

3. Claim 3: "The mechanical fuel lockout switch for a dual fuel engine of claim 1, wherein the fuel lockout apparatus comprises a flange rigidly coupled to the mechanical fuel valve that covers an inlet of the second fuel line while the mechanical fuel valve is in the first position and uncovers the inlet of the second fuel line while the mechanical fuel valve is in the second position."

[0180]. The combination of DuroMax and Elsdon teaches claim 3. The combination of DuroMax and Elsdon discloses a fuel lockout apparatus coupled to a mechanical fuel valve. *Supra*, §VII.A.3.c. The fuel lockout apparatus includes a cap. *Supra*, §VII.A.3.c.

[0181]. A POSA would have understood it to be obvious to have rigidly connected the DuroMax mechanical fuel valve to the cap of Eldson such that the DuroMax valve handle and shaft rotate together with Elsdon cap 16. *Supra* §§VII.A.1.a.1-2; VII.A.1.c. A POSA would have further considered it to be obvious to have arranged the mechanical fuel valve and cap assembly of DuroMax and Eldson adjacent to the LPG input such that the cap of Eldson rotates over and also covers the LPG inlet (preventing coupling thereto) when the mechanical fuel

valve is placed into an open position and uncovers the LPG inlet (permitting coupling thereto) when the mechanical fuel valve is placed into the closed position. *Supra* §VII.A.1.a.1-2.

[0182]. Accordingly, a POSA would have understood that the combination of DuroMax and Elsdon teaches claim 3.

4. Claim 4: "The mechanical fuel lockout switch for a dual fuel engine of claim 3, wherein the mechanical fuel valve rotates between the first position and the second position and the flange rotates transversely across the inlet of the second fuel line."

[0183]. The combination of DuroMax and Elsdon teaches claim 4. DuroMax discloses a mechanical fuel valve that rotates between a first position and a second position. *Supra*, §VII.A.1.b. Elsdon discloses a flange comprising a cap and shield. *Supra*, §VII.A.1.b.

[0184]. That the cap and shield are arranged such that when the cap is in a closed position, the fluid coupler is protectively disclosed therebetween, and when the cap is rotated from a closed position to an open position, the coupler is exposed. Ex.1005, 2:19-23. A POSA would have understood that the cap and shield can thus rotate transversely across the inlet of a fuel line.

[0185]. Accordingly, a POSA would have understood that when the combination fuel valve of DuroMax is connected to the cap of Elsdon, the mechanical fuel valve rotates between the first position and the second position

and the flange rotates transversely across the inlet of the second fuel line as recited in claim 4. *Supra* §§VII.A.1.a.1-2.

5. Claim 6: "The mechanical fuel lockout switch for a dual fuel engine of claim 1, wherein the mechanical fuel valve and the fuel lockout apparatus operate together to ensure that fuel from the first fuel source and fuel from the second fuel source are not simultaneously delivered to the dual fuel engine."

[0186]. The combination of DuroMax and Elsdon teaches claim 6. A POSA would have considered it obvious to have connected the mechanical gasoline valve of DuroMax to the cap of Eldson to prevent the simultaneous delivery of gasoline and LPG fuel to the engine. *Supra* §§VII.A.1.a.1-2

[0187]. Specifically, a POSA would have been motivated to connect the Elsdon fuel conduit coupler cap to the mechanical fuel valve of DuroMax to restrict access to the LPG hose connector interface of DuroMax when the DuroMax generator gasoline valve is in the open position.

[0188]. Likewise, the combination would prevent the gasoline valve of DuroMax from being moved from the closed to the open position when an LPG hose is connected to the LPG hose connector interface due to the interference between the Eldson flange with the LPG hose. *Supra* §§VII.A.1.a.1-2. Accordingly, a POSA would have understood that the combination of DuroMax and Elsdon teaches claim 6.

6. Claim 7: "The mechanical fuel lockout switch for a dual fuel engine of claim 6, wherein the first fuel source provides liquid fuel from a liquid fuel tank to the dual fuel engine and the second fuel source provides gaseous fuel from a pressurized fuel container to the dual fuel engine."

[0189]. DuroMax teaches claim 7. DuroMax discloses a first fuel tank and a second fuel tank. Ex.1004, p.1.



Ex.1004, p.1

[0190]. The first fuel tank provides gasoline, and the second fuel tank provides propane. Ex.1004, pp. 7, 11-12. A POSA would have understood that DuroMax discloses a first fuel source that provides liquid fuel from a liquid fuel tank to the dual fuel engine.

[0191]. A POSA would also have understood that DuroMax discloses a second fuel source that provides gaseous fuel from a pressurized fuel container to the dual fuel engine. *Id.*

[0192]. Accordingly, a POSA would have understood that DuroMax teaches claim 7.

7. Independent claim 15

a. Element [15.0]: "A mechanical fuel lockout switch for a dual fuel engine comprising"

[0193]. To the extent the preamble is limiting, DuroMax teaches [15.0] for at least the same reasons as [1.0]. *Supra*, §VII.A.1.a

b. Element [15.1]: "a mechanical fuel valve actuateable between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line; and"

[0194]. DuroMax teaches [15.1] for at least the same reasons as [1.1]. *Supra,* §VII.A.1.b

c. Element [15.2]: "a fuel lockout apparatus coupled to the mechanical fuel valve;"

[0195]. The combination DuroMax and Elsdon teaches [15.2] for at least the same reasons as [1.2]. *Supra,* §VII.A.1.c.

d. Element [15.3]: "wherein the mechanical fuel lockout switch: communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the

mechanical fuel valve is in the first position, and communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position; and"

[0196]. DuroMax teaches [15.3] for at least the same reasons as [1.3]. *Supra*, §VII.A.1.d.

e. Element [15.4]: "wherein the fuel lockout apparatus prevents actuation of the mechanical fuel valve to the first position when the second fuel source communicates with the dual fuel engine."

[0197]. The combination of DuroMax and Elsdon teaches [15.4] for at least the same reasons as claim 2. *Supra*, §VII.A.2.

B. Ground 2A/2B: Hallberg Anticipates Claims 1, 6, 7, and 9 (Ground 2A) and Renders Obvious Claims 2 and 15 (Ground 2B).

[0198]. As explained in sections §§VII.B.1-VII.B.5 below, it is my opinion that a POSA would have found that Hallberg teaches and/or suggests the limitations of claims 1, 2, 6, 7, 9 and 15. A POSA would have therefore found that Hallberg anticipates claims 1, 6, 7 and 9, and renders obvious claims 2, and 15.

1. Independent claim 1

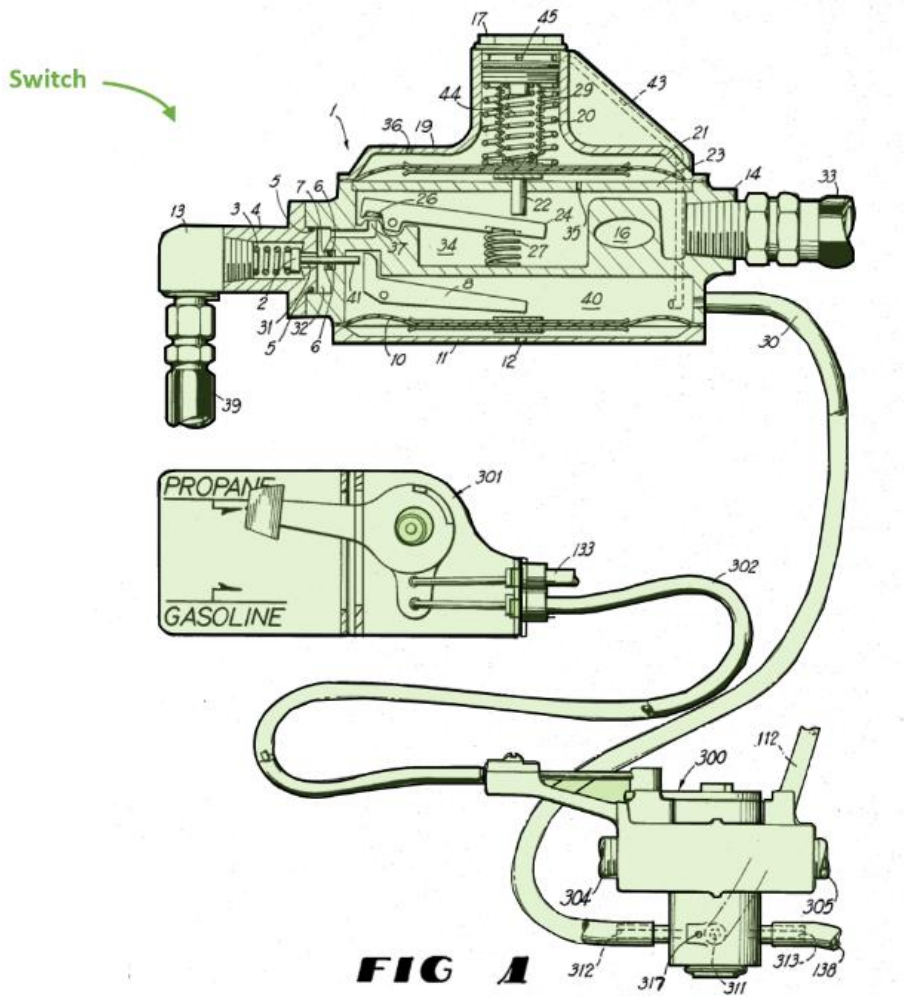
a. Element [1.0]: "A mechanical fuel lockout switch for a dual fuel engine comprising:"

[0199]. It is my opinion that to the extent the preamble is limiting, a POSA would understand that Hallberg discloses *"A mechanical fuel lockout switch for a dual fuel engine."*

[0200]. Hallberg discloses "a system which may be used with conventional internal combustion engines…to permit alternative utilization of a liquified gas fuel...such as propane…and a liquid fuel…such as gasoline. Ex. 1006, 3:49-55.

[0201]. The system includes a mechanical fuel lockout switch comprising a fluid dual valve control 301, a liquified-to-gaseous fuel converter 1, and a fluid dual valve structure 300. Ex. 1006, 7:5-7, 7:27-29.

[0202]. As shown in FIG. 1 (below), the liquified-to-gaseous fuel converter and fluid dual valve structure are controlled by a fluid dual valve control 301 that selects one of the two positions, either a "gasoline" position or a "propane" position. Ex. 1006, 7:27-29, Fig. 1.



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

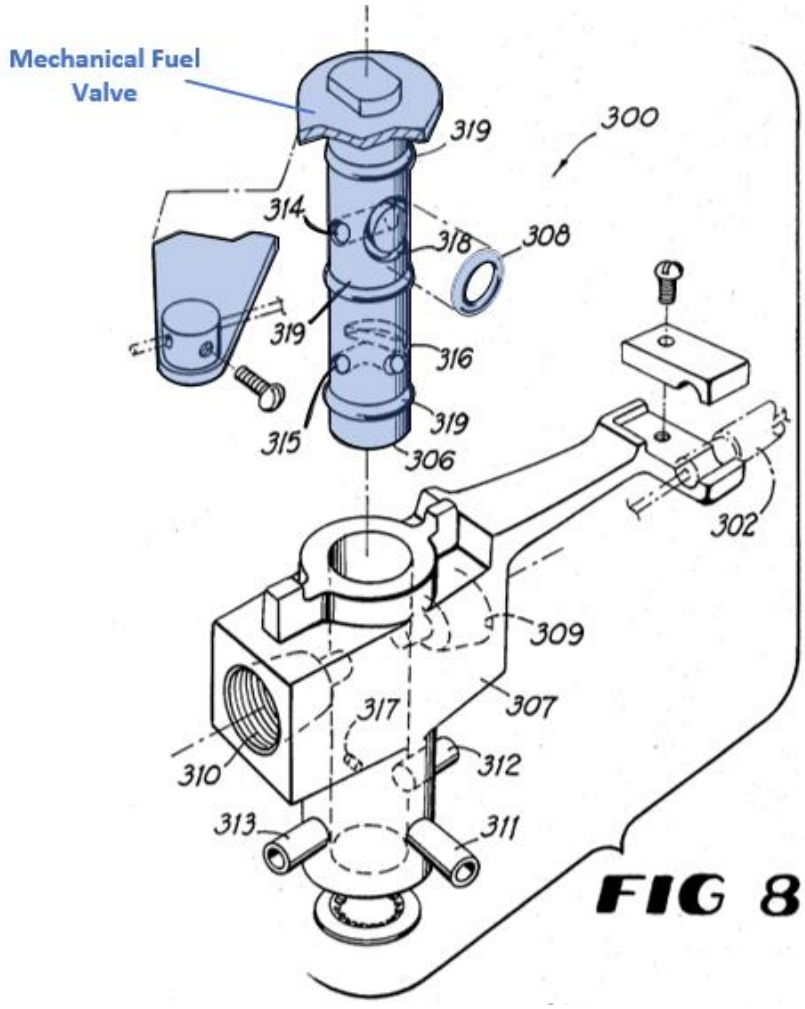
[0203]. A POSA would therefore understand that the fluid dual valve control 301, the liquified-to-gaseous fuel converter 1, and the fuel dual valve structure 300 form a mechanical fuel lockout switch.

[0204]. Accordingly, it is my opinion that a POSA would understand that Hallberg teaches *"a mechanical fuel lockout switch for a dual fuel engine"* as recited in [1preamble].

b. Element [1.1] "a mechanical fuel valve actuateable between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line; and"

[0205]. A POSA would understand that Hallberg discloses *"a mechanical fuel valve actuateable between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line"* as recited in claim limitation [1a].

[0206]. Hallberg discloses a mechanical fuel valve as shown in FIG. 8 below ("[i]n the figures…300 is the fluid dual valve structure." Ex. 1006, 7:5-7). Positioning of control 301 in "gasoline" mode acts through control cable 302 to rotate spool 306 within valve body 307 such that gasoline from gasoline supply line 304, supplied to the carburetor 110, locks out the flow of propane. Ex. 1006, 7:27-57.



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

[0207]. As shown in FIG. 10 below, when the mechanical fuel valve is in gasoline mode, liquid inlet opening 309 and liquid outlet opening 310 communicate through tunnel 314. Ex. 1006, 7:40-7:43.

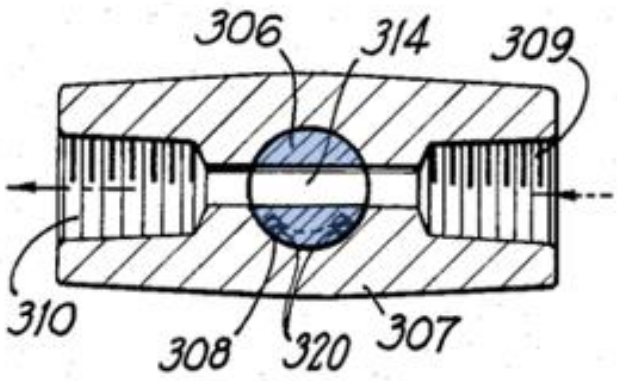


FIG 10

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

[0208]. A POSA would understand that the mechanical fuel valve is actuatable to a first position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line. As shown in FIG. 10 below, when the mechanical fuel valve is in the first position (e.g. gasoline mode), the first fuel source (e.g., gasoline) is communicated to the dual fuel engine via a first fuel line (e.g. liquid inlet opening 309 and liquid outlet opening 310).

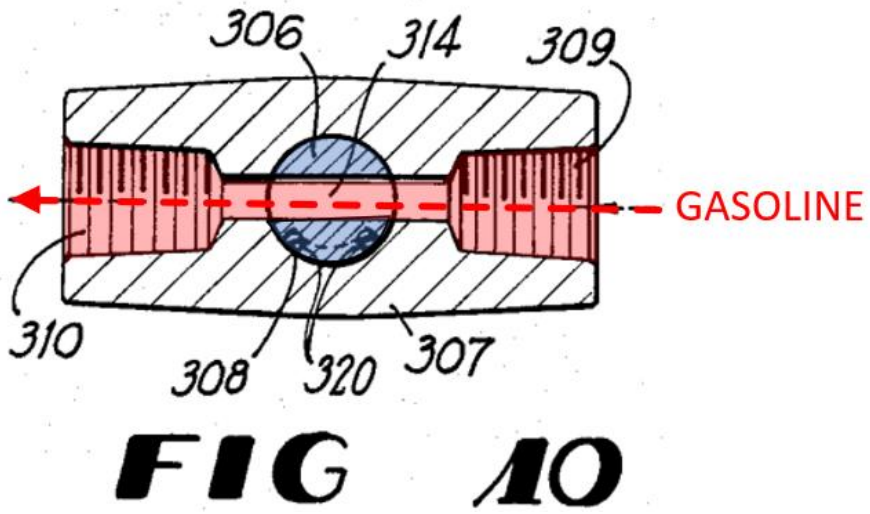
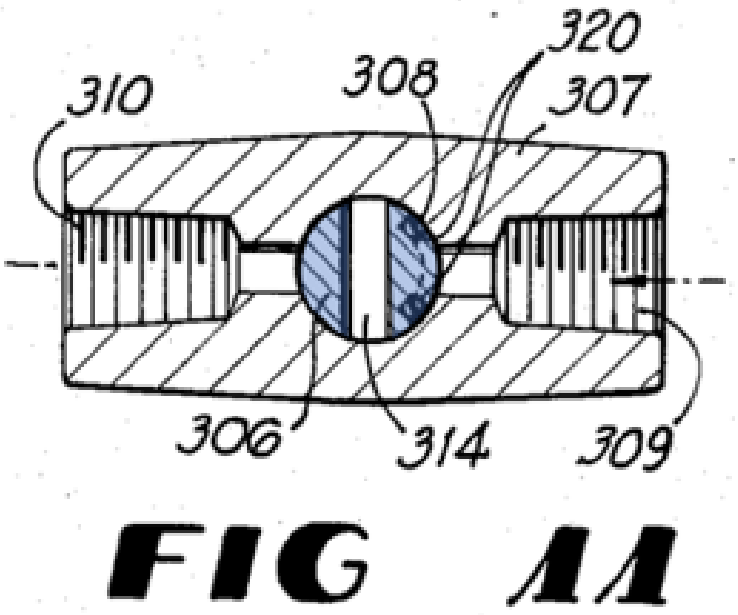


FIG 10

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

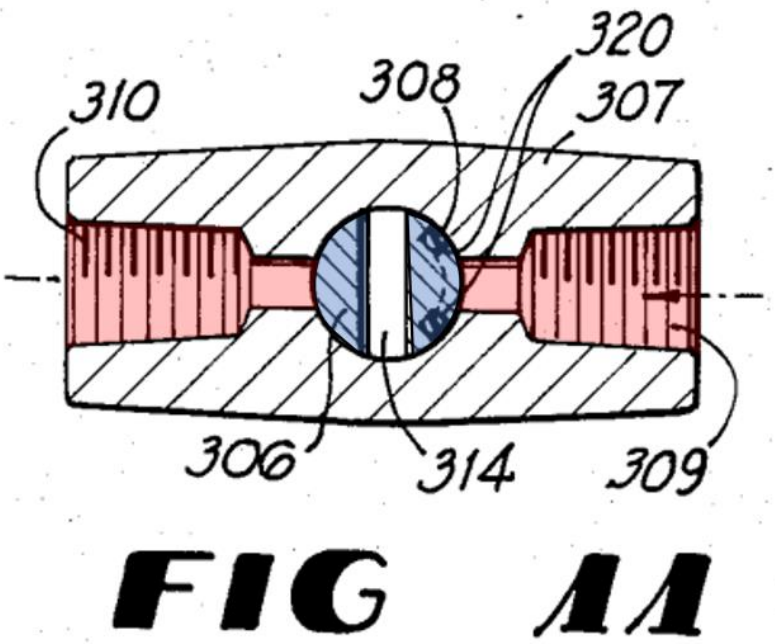
[0209]. As shown in FIG. 11 (below) when "propane" mode of control 301 is selected, spool 306 is rotated within valve body 307 by control cable 302 such that O-ring 308 on the face of spool 306 forms a seal between spool 306 and valve body 307 around liquid inlet opening 309. Ex. 1006, 8:3-7. Forming a seal between the spool 306 and valve body 307, prohibits the flow of gasoline to conventional carburetor 110. Ex. 1006, 8:7-10.



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

[0210]. A POSA would understand that during propane mode spool 306 is rotated within valve body 307 such that gasoline is prevented from flowing through liquid outlet opening 310. As shown in FIG. 11 below, when the mechanical fuel valve is in the second position (e.g. propane mode), the first fuel

source (e.g., gasoline) is prevented from communicating to the dual fuel engine via the first fuel line (e.g. liquid inlet opening 309 and liquid outlet opening 310).



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

[0211]. As shown in FIG. 13 (below), during "propane" mode of operation, duct 315 within spool 306 is simultaneously aligned to communicate with vacuum inlet port 311 and first vacuum outlet port 312. Ex. 1006, 8:23-26, Fig. 13. Communicating vacuum inlet port 311 with the first vacuum outlet port 312 connects converter vacuum line 30 (shown in FIG. 1) to the intake manifold, via intake manifold line 112. Ex. 1006, 8:26-30.

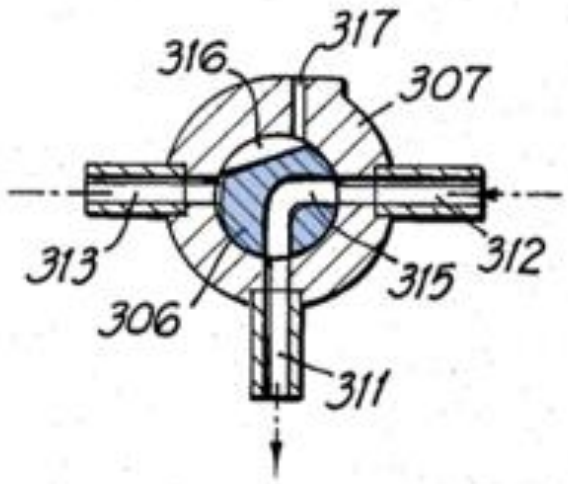
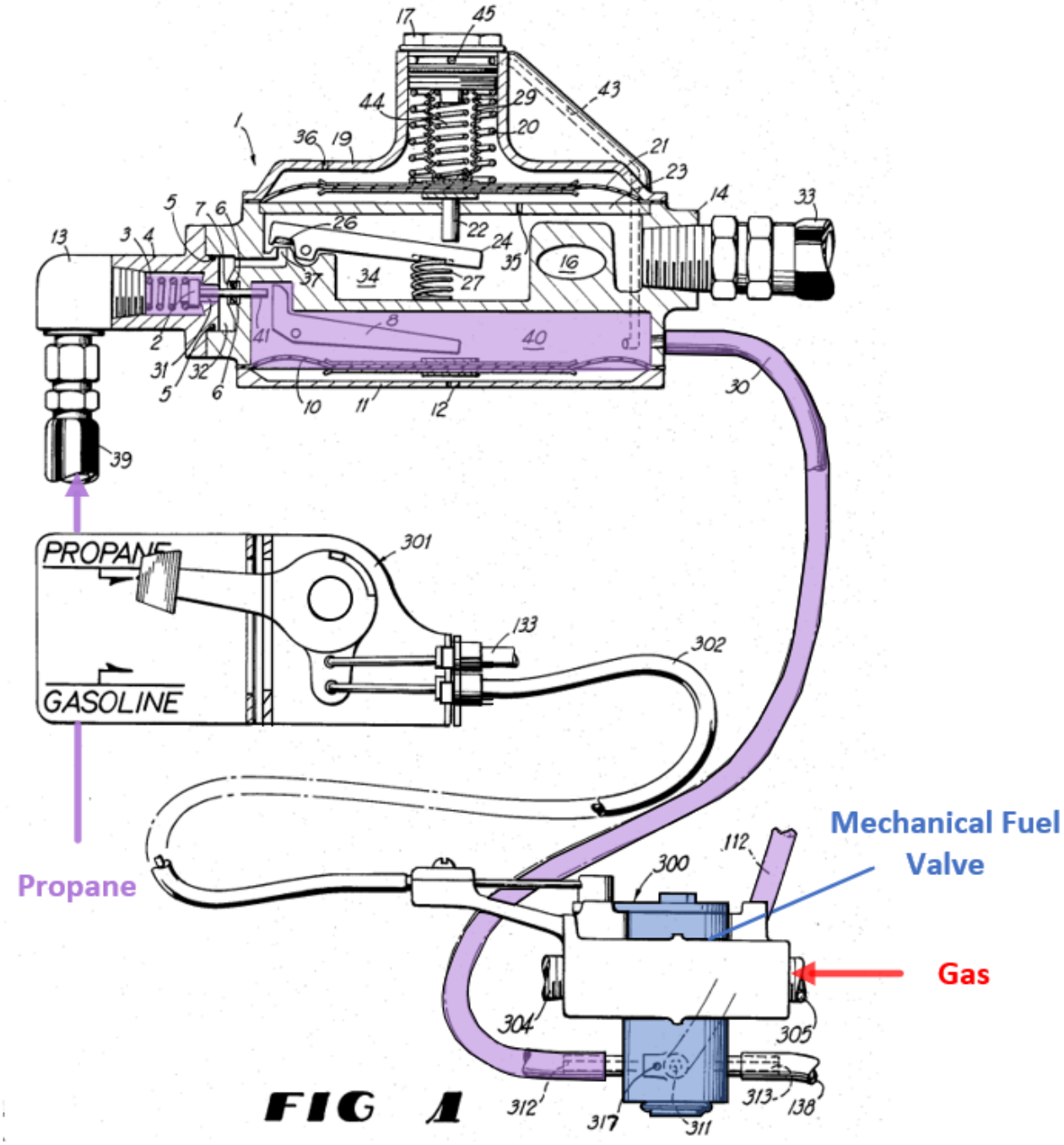


FIG 13

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

[0212]. During "propane" mode operation, when the engine is started, a vacuum is created in intake manifold vacuum line 112, and vacuum line 30, urging diaphragm 10 upward against liquid inlet lever 8. Ex. 1006, 8:31-38, FIG. 1. Actuating inlet lever 8 drives inlet valve shaft 41 against bias spring 3 which opens liquid inlet valve 2 allowing liquified gaseous fuel (propane) to flow through the propane fuel line to the engine. Ex. 1006, 8:38-42, FIG. 1. Figure 1 of Hallberg is reproduced below.



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

[0213]. A POSA would understand that actuating the mechanical fuel valve to a second position (e.g., propane) selectively controls the flow of fuel to the

dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line.

[0214]. A POSA would therefore understand that the mechanical fuel valve is actuateable between a first position (e.g., gasoline) and a second position (e.g., propane) to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line.

[0215]. Accordingly, it is my opinion that a POSA would understand that Hallberg teaches *"a mechanical fuel valve actuateable between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line"* as recited in limitation [1a].

c. Element [1.2] "a fuel lockout apparatus coupled to the mechanical fuel valve;"

[0216]. A POSA would also understand that Hallberg discloses *"a fuel lockout apparatus coupled to the mechanical fuel valve"* as recited in claim limitation [1b].

[0217]. As discussed in §§VI.A, VI.B, *supra*, a POSA would understand that the plain and ordinary meaning of the composite term "fuel lockout

apparatus" is a "set of…equipment designed" for "preventing the flow of fuel" and the plain and ordinary meaning of "coupled" is "to attach."

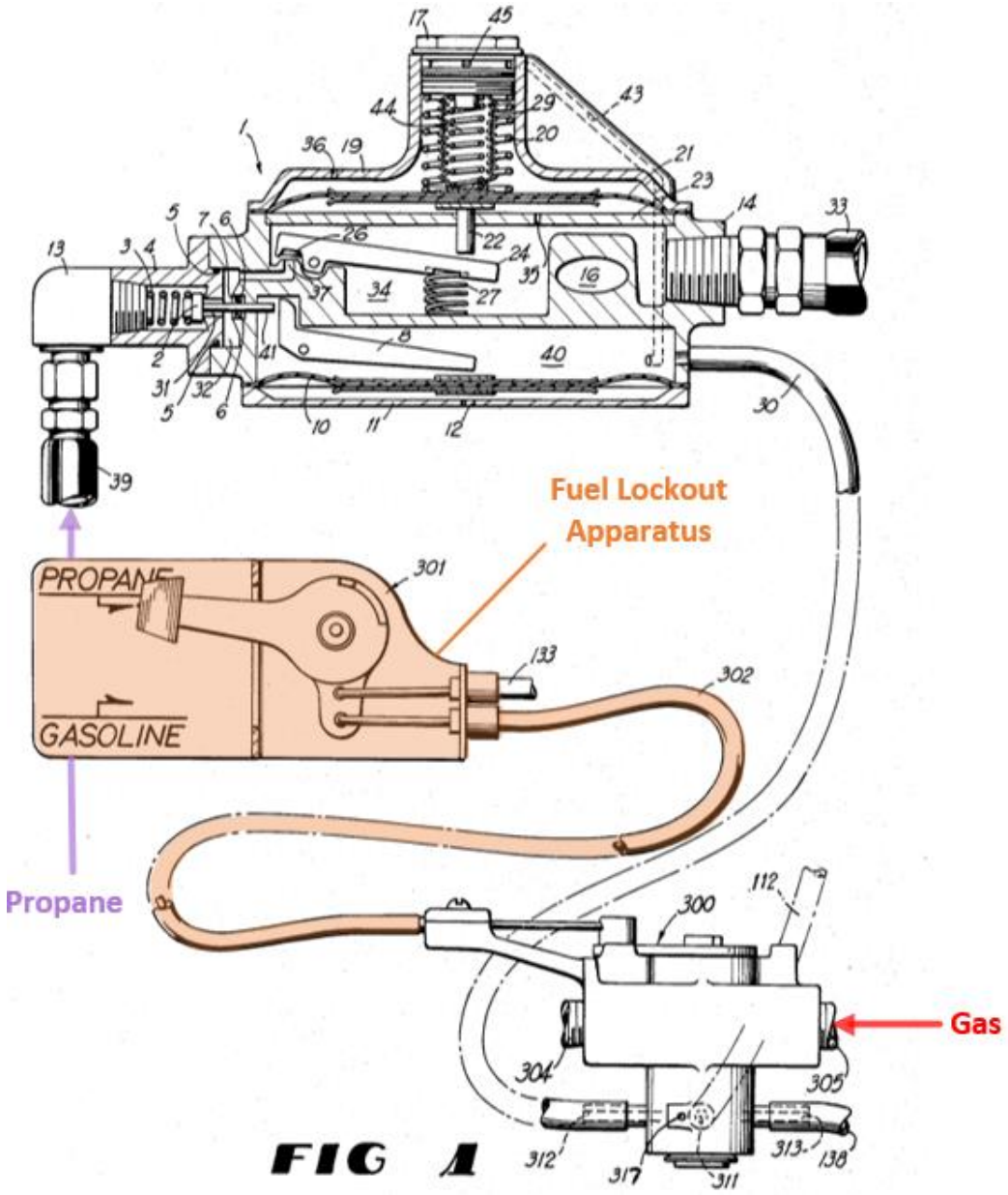
[0218]. In looking to the fuel lockout apparatus and mechanical fuel valve, it is my opinion that a POSA would understand that Hallberg discloses both. A POSA would understand that Hallberg discloses a mechanical fuel valve. *Supra*, §VII.B.1.b. A POSA would also understand that Hallberg discloses a fuel lockout apparatus coupled to the mechanical fuel valve (fluid dual valve structure 300), the fuel lockout apparatus being configured to perform the function described in limitation [1d] of claim 1 (discussed hereinafter in §VII.B.1.e).

[0219]. First, Hallberg discloses a fuel lockout apparatus comprising fluid dual value control 301 and control cable 302. Ex. 1006, 7:27-44. As shown in FIG. 1 (below), the fuel lockout apparatus comprising fluid dual value control 301 and control cable 302 is coupled to fluid dual valve structure 300. Ex. 1006, 7: 28-36 and 8:3-9.

[0220]. Positioning control 301 in the "gasoline" mode acts through control cable 302 to permit gasoline to flow through fluid dual valve structure 300, and to lock out propane from flowing through fluid dual valve structure 300. §VII.B.1.b, *supra*.

[0221]. Positioning control 301 in the "propane" mode acts through control cable 302 to permit propane to flow from propane supply port 39 to the

mixer 100, and to lock out gasoline from flowing through fluid dual valve structure 300. §VII.B.1.b, *supra*.



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

[0222]. A POSA would understand that the components of the fuel lockout apparatus (fluid dual value control 301 and control cable 302) can be

actuated and/or engaged to allow propane to flow through propane supply line 39 to the internal combustion engine. If the components of the fuel lockout apparatus are not actuated and/or engaged, propane is not supplied to the dual fuel generator.

[0223]. Hallberg also discloses that the fuel lockout apparatus is coupled to the mechanical fuel valve. A POSA would have understood "coupled" to mean "attached." Supra, §VII.B. As shown in FIG. 1 (below), control cable 302 couples the fuel lockout apparatus comprising fluid dual value control 301 and control cable 302 to the mechanical fuel valve. Without control cable 302, the fluid dual valve control 301 would be unable to rotate spool 306 within the valve body 307. Ex.1006, 7:30-33.

[0224]. Accordingly, a POSA would have understood that Hallberg teaches a fuel lockout apparatus coupled to the mechanical fuel valve as recited in element [1.2].

d. Element [1.3] "wherein the mechanical fuel lockout switch: communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position; and"

[0225]. It is my opinion that a POSA would understand that Hallberg discloses *"wherein the mechanical fuel lockout switch: communicates the first fuel*

source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position" as recited in claim limitation [1c].

[0226]. Hallberg discloses that when gasoline is selected on the fluid dual valve control 301, spool 306, within valve body 307, is rotated such that gasoline from gasoline supply line 304 is supplied to the carburetor 110 through engine gasoline line 305. Ex. 1006, 7:27-44.

[0227]. As shown in FIG. 10 below, when gasoline is selected, gasoline is communicated through inlet opening 309, tunnel 314 and liquid outlet opening 310.

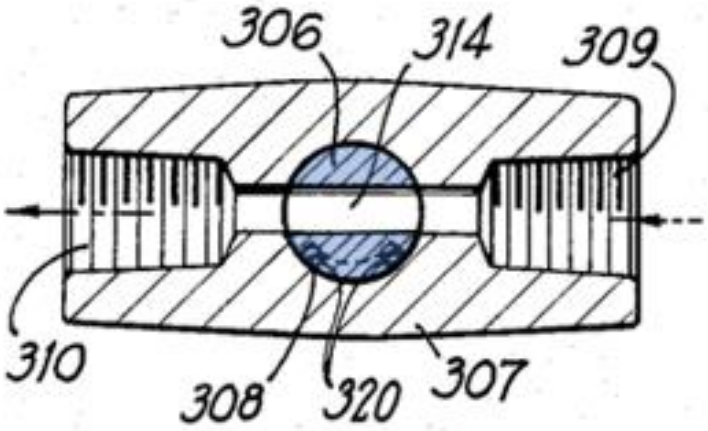


FIG 10

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

[0228]. During gasoline mode, the fuel lockout apparatus prevents the flow of propane to the internal combustion engine. *Supra*, §VII.B.1.c. It is my understanding that when the mechanical fuel valve is in the first position (gasoline mode), the mechanical fuel lockout switch communicates the first fuel (gasoline) source to the dual fuel engine and prevents communication between the second fuel (propane) source and the dual fuel engine.

[0229]. When propane mode is selected on the fluid dual valve control 301, propane is provided to the dual fuel engine. Ex. 1006, 8:3-57. As described in §§VII.B.1.b, VII.B.1.c, *supra*, when propane mode is selected, spool 306 is rotated within valve body 307 to form a seal to prevent the flow of gasoline to the engine and a vacuum is created in line 30, urging diaphragm 10 upward against liquid inlet lever 8 which drives fuel 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.

[0230]. A POSA would therefore understand that when the mechanical fuel valve is in a second position (propane mode), the mechanical fuel lockout switch communicates the second fuel (propane) source to the dual fuel engine and interrupts the first fuel (gasoline) source communication with the dual fuel engine.

[0231]. Accordingly, it is my opinion that a POSA would understand that Hallberg teaches *"wherein the mechanical fuel lockout switch: communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position"* as recited in claim limitation [1c].

e. Element [1.4] "wherein the fuel lockout apparatus is configured to: prevent the second fuel source from coupling to the second fuel line while the mechanical fuel valve is in the first position; and permit the second fuel source to couple to the second fuel line while the mechanical fuel valve is in the second position."

[0232]. It is my opinion that a POSA would understand that Hallberg discloses *"wherein the fuel lockout apparatus is configured to: prevent the second fuel source from coupling to the second fuel line while the mechanical fuel valve is in the first position; and permit the second fuel source to couple to the second fuel line while the mechanical fuel valve is in the second position"* as recited in claim limitation [1d].

[0233]. A POSA would understand that Hallberg discloses a structure, that teaches a fuel lockout apparatus. *Supra*, §VII.B.1.c. First, Hallberg discloses

a fuel lockout apparatus comprising fluid dual valve control 301 and control cable 302. *Supra,* §VII.B.1.c.

[0234]. The fluid dual valve control 301 and control cable 302 can be actuated and/or engaged to allow either gasoline or propane to flow to the internal combustion engine. *Supra,* §VII.B.1.c. Positioning control 301 in gasoline mode, acts through control cable 302, to rotate spool 306 within valve body 307 to permit gasoline (e.g., a first fuel) to flow through fluid dual valve structure 300 (e.g., a mechanical fuel valve) and lock out propane (e.g., a second fuel) from flowing through fluid dual valve structure 300. *Supra,* §VII.B.1.b.

[0235]. A POSA would understand that the fluid dual valve control 301 and control cable 302 is therefore a fuel lockout apparatus configured to prevent a second fuel source from coupling to the second fuel line while the mechanical fuel valve is in the first position.

[0236]. Positioning control 301 in propane mode, acts through control cable 302, to rotate spool 306 within valve body 307, to create a vacuum in line 30, which opens liquid inlet valve 2, allowing propane to flow through the propane fuel line to the engine. Ex. 1006, 8:38-42.

[0237]. It is my opinion that a POSA would understand that the fuel lockout apparatus is therefore configured to permit the second fuel source to

couple to the second fuel line while the mechanical fuel valve is in the second position.

[0238]. As discussed in §§VII.B.1.b, VII.B.1.c, VII.B.1.d, *supra*, when propane mode is selected (and mechanical fuel valve is in second position) a vacuum is created in line 30, urging diaphragm 10 upward against liquid inlet lever 8, which drives fuel inlet valve shaft 41 against bias spring 3, which opens liquid inlet valve 2 allowing propane to flow through the propane fuel line to the engine. Ex. 1006, 8:38-57.

[0239]. A POSA would understand that when the mechanical fuel valve is in the second position, the second fuel source is coupled to the second fuel line.

[0240]. A POSA would therefore understand that the lock-out of the fuel lockout apparatus of Hallberg prevents the mechanical fuel valve from coupling the second fuel source when the mechanical fuel valve is in the first position and permits the second fuel source to couple with the second fuel line when the mechanical fuel valve is in the second position.

[0241]. Accordingly, it is my opinion that a POSA would understand that Hallberg teaches *"wherein the fuel lockout apparatus is configured to: prevent the second fuel source from coupling to the second fuel line while the mechanical fuel valve is in the first position; and permit the second fuel source to couple to the*

second fuel line while the mechanical fuel valve is in the second position" as recited in claim limitation [1d].

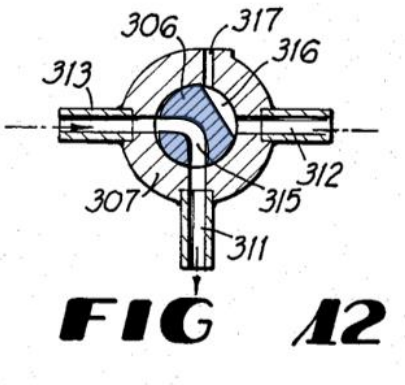
2. Claim 2: "The mechanical fuel lockout switch for a dual fuel engine of claim 1, wherein the fuel lockout apparatus prevents actuation of the mechanical fuel valve to the first position when the second fuel source communicates with the dual fuel engine."

[0242]. It is my opinion that a POSA would understand that Hallberg discloses *"wherein the fuel lockout apparatus prevents actuation of the mechanical fuel valve to the first position when the second fuel source communicates with the dual fuel engine"* as recited in claim 2.

[0243]. As described in §VII.B.1.e, *supra,* a POSA would understand that operation of the mechanical fuel valve and the fuel lockout apparatus is interconnected such that only one fuel can be communicated to the engine at one time.

[0244]. As shown in FIG. 12, positioning of control 301 in the "gasoline" mode acts through control cable 302 to rotate spool 306 within valve body 307 such that converter vacuum line 30 (communicating with first vacuum outlet port 312) is open to the atmosphere through notch 316 between first vacuum outlet port 312 and vent 317. Ex. 1006, 7:30-38.

[0245]. In this configuration, no vacuum is provided to vacuum line 30.



Ex. 1006, FIG. 12 (Emphasis Added).

[0246]. As described in §§VII.B.1.b, VII.B.1.c, *supra*, when propane mode is engaged, spool 306 is rotated within valve body 307 to form a seal between spool 306 and valve body 307.

[0247]. When the spool 306 is rotated, vacuum inlet port 311 and vacuum outlet port 312 are aligned to provide vacuum, via vacuum line 30, to the fuel lockout apparatus to open liquid inlet valve 2. *Supra*, §§VII.B.1.b, VII.B.1.c.

[0248]. It is my understanding that when propane is communicated to the engine and vacuum is provided to the fuel lockout apparatus via vacuum line 30, the rotatable spool cannot be in a gasoline position as it is well known in the art that when a valve is in a first position, it cannot be in a second position.

[0249]. A POSA would therefore understand that the fuel lockout apparatus therefore prevents actuation of the mechanical fuel valve to a first position (i.e., gasoline) when propane is communicated to the dual fuel engine.

[0250]. Accordingly, it is my opinion that a POSA would understand that Hallberg teaches and/or suggests *"wherein the fuel lockout apparatus prevents actuation of the mechanical fuel valve to the first position when the second fuel source communicates with the dual fuel engine"* as recited in claim 2.

3. Claim 6 "The mechanical fuel lockout switch for a dual fuel engine of claim 1, wherein the mechanical fuel valve and the fuel lockout apparatus operate together to ensure that fuel from the first fuel source and fuel from the second fuel source are not simultaneously delivered to the dual fuel engine."

[0251]. It is my opinion that a POSA would understand that Hallberg discloses *"wherein the mechanical fuel valve and the fuel lockout apparatus operate together to ensure that fuel from the first fuel source and fuel from the second fuel source are not simultaneously delivered to the dual fuel engine"* as recited in claim 6.

[0252]. "Operate" in its plain and ordinary meaning, is defined as "to (cause to) work." Ex. 1009, pp.12-18. "Together" in its plain and ordinary meaning, is defined as "with each other." Ex. 1009, pp.19-24. Accordingly, it is my understanding that the plain and ordinary meaning of "operating together" is "to cause to work with each other."

[0253]. Hallberg discloses a mechanical fuel valve actuateable between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source and a second fuel source. *Supra*, §VII.B.1.b.

[0254]. Hallberg also discloses a fuel lockout apparatus configured to prevent the second fuel source from coupling to the second fuel line while the mechanical fuel valve is in the first position and permit the second fuel source to couple to the second fuel line while the mechanical fuel valve is in the second position. *Supra*, §VII.B.1.e.

[0255]. The fuel lockout apparatus also prevents actuation of the mechanical fuel valve to the first position when the second fuel source communicates with the dual fuel engine. *Supra,* §VII.A.2.

[0256]. A POSA would therefore understand that the mechanical fuel valve and fuel lockout apparatus "function with each other" to ensure that the first fuel and the second fuel are not simultaneously delivered to the dual fuel engine.

[0257]. Accordingly, it is my opinion that a POSA would understand that Hallberg teaches *"wherein the mechanical fuel valve and the fuel lockout apparatus operate together to ensure that fuel from the first fuel source and fuel from the second fuel source are not simultaneously delivered to the dual fuel engine"* as recited in claim 6.

4. Claim 7 "The mechanical fuel lockout switch for a dual fuel engine of claim 6, wherein the first fuel source provides liquid fuel from a liquid fuel tank to the dual fuel engine and the second fuel source provides gaseous fuel from a pressurized fuel container to the dual fuel engine."

[0258]. It is my opinion that a POSA would understand that Hallberg discloses *"wherein the first fuel source provides liquid fuel from a liquid fuel tank to the dual fuel engine and the second fuel source provides gaseous fuel from a pressurized fuel container to the dual fuel engine"* as recited in claim 7.

[0259]. Hallberg discloses that gasoline is provided to the dual fuel engine by way of the carburetor (e.g. "gasoline from gasoline supply line 304 is supplied to the carburetor 110 through engine gasoline line 305." Ex. 1006, 7:36-43).

[0260]. Propane is supplied to the dual fuel engine by way of the mixer ("the mixer 100 admits pressurized gaseous fuel to the engine." Ex. 1006, 8:56-60). The propane is stored in a pressurized fuel tank ("[l]iquified petroleum gas, propane and the other "gaseous" fuels with which the present invention is intended to be used are normally held for use in a reservoir or tank under sufficient pressure and at a temperature such that the fuels are in a liquid state." Ex. 1006, 1:54-58).

[0261]. A POSA would therefore understand that the first fuel source provides liquid fuel from a liquid fuel tank to the dual fuel engine and the second fuel source provides gaseous fuel from a pressurized fuel container to the dual fuel engine.

[0262]. Accordingly, it is my opinion that a POSA would understand that Hallberg teaches *"wherein the first fuel source provides liquid fuel from a*

liquid fuel tank to the dual fuel engine and the second fuel source provides gaseous fuel from a pressurized fuel container to the dual fuel engine" as recited in claim 7.

5. Independent claim 15

a. Element [15.0]: "A mechanical fuel lockout switch for a dual fuel engine comprising:"

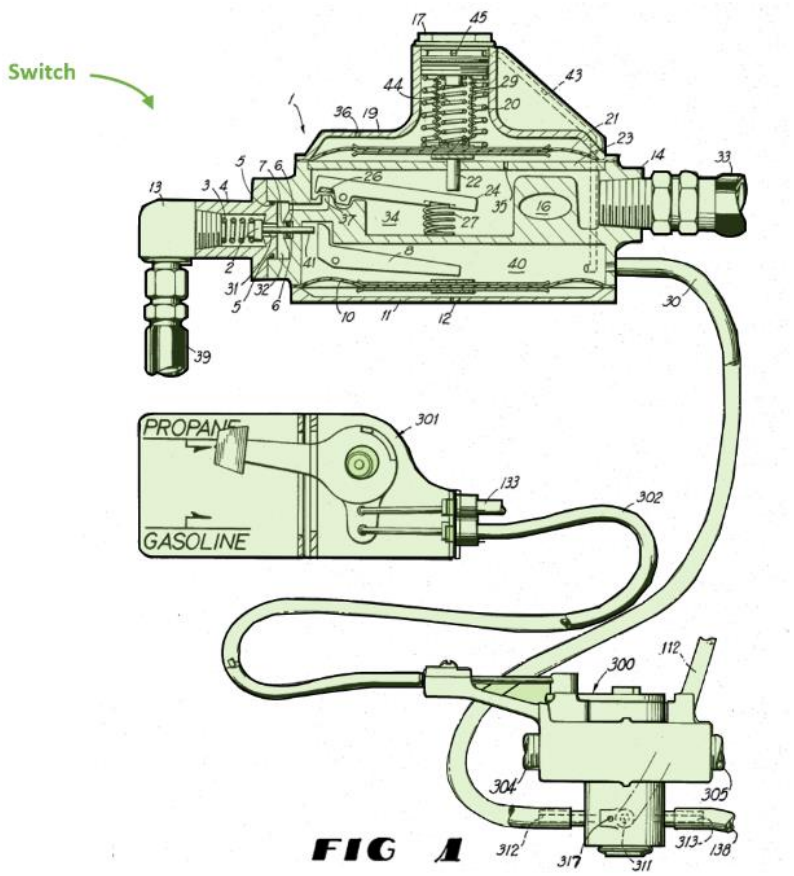
[0263]. It is my opinion that to the extent the preamble is limiting, a POSA would understand that Hallberg discloses *"A mechanical fuel lockout switch for a dual fuel engine."*

[0264]. Claim limitation [15preamble] contains similar language to that of [1preamble]. My opinion that a POSA would understand that Hallberg discloses claim limitation [15preamble] is thus similar to that of claim limitation [1preamble].

[0265]. Hallberg discloses a system which may be used with conventional internal combustion engines…to permit alternative utilization of a liquified gas fuel...such as propane…and a liquid fuel…such as gasoline. Ex. 1006, 3:49-55.

[0266]. The system includes a mechanical fuel lockout switch comprising a fluid dual valve control 301, a liquified-to-gaseous fuel converter 1, and a fluid dual valve structure 300. Ex. 1006, 7:5-7, 7:27-29.

[0267]. As shown in FIG. 1 (below), the liquified-to-gaseous fuel converter and fluid dual valve structure are controlled by a fluid dual valve control 301 that selects one of the two positions, either "gasoline" or "propane" position. Ex. 1006, 7:27-29, Fig. 1.



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

[0268]. A POSA would therefore understand that the fluid dual valve control 301, the liquified-to-gaseous fuel converter 1, and the fuel dual valve structure 300 form a mechanical fuel lockout switch. Accordingly, it is my opinion

that a POSA would understand that Hallberg teaches a mechanical fuel lockout switch for a dual fuel engine.

[0269]. Accordingly, it is my opinion that a POSA would understand that Hallberg teaches *"a mechanical fuel lockout switch for a dual fuel engine"* as recited in [1 preamble].

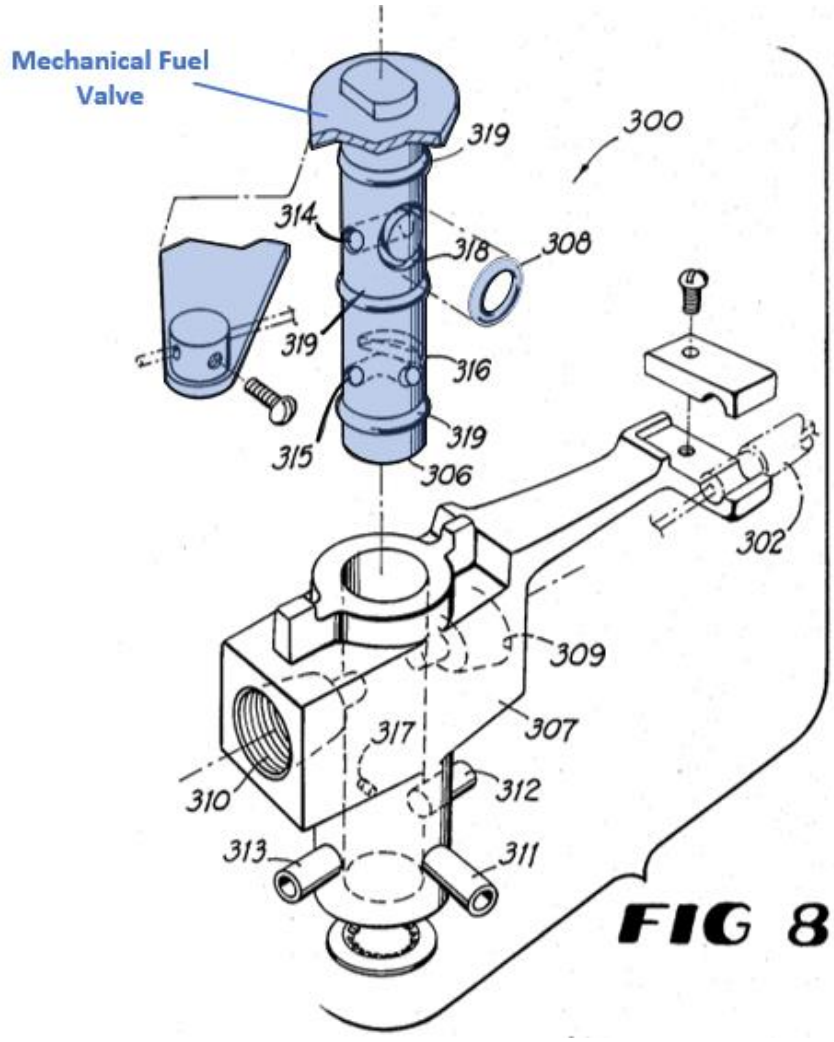
b. Element [15.1] a mechanical fuel valve actuateable between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line; and

[0270]. It is my opinion that to the extent the preamble is limiting, a POSA would understand that Hallberg discloses: *"a mechanical fuel valve actuateable between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line"* as recited in claim limitation [15a].

[0271]. Claim limitation [15a] contains similar language to that of [1a]. My opinion that a POSA would understand that Hallberg discloses claim limitation [15a] is thus similar to that of claim limitation [1a].

[0272]. Hallberg discloses a mechanical fuel valve as shown in FIG. 8 below ("[i]n the figures…300 is the fluid dual valve structure." Ex. 1006, 7:5-7). Positioning of control 301 in "gasoline" mode acts through control cable 302 to

rotate spool 306 within valve body 307 such that gasoline from gasoline supply line 304, supplied to the carburetor 110, locks out the flow of propane. Ex. 1006, 7:27-57.



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

[0273]. As shown in FIG. 10 below, when the mechanical fuel valve is in gasoline mode, liquid inlet opening 309 and liquid outlet opening 310 communicate through tunnel 314. Ex. 1006, 7:40-7:43.

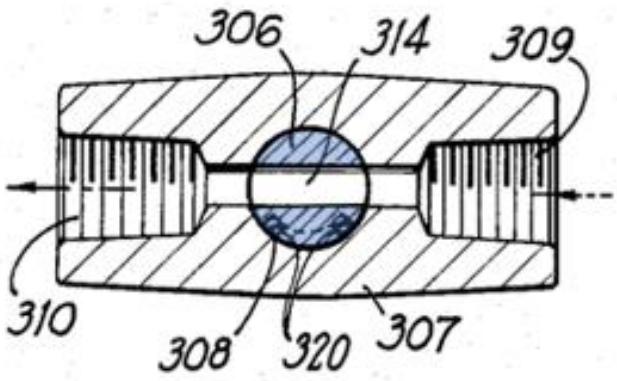


FIG 10

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

[0274]. A POSA would understand that the mechanical fuel valve is actuatable to a first position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line. As shown in FIG. 10 below, when the mechanical fuel valve is in the first position (e.g. gasoline mode), the first fuel source (e.g., gasoline) is communicated to the dual fuel engine via a first fuel line (e.g. liquid inlet opening 309 and liquid outlet opening 310).

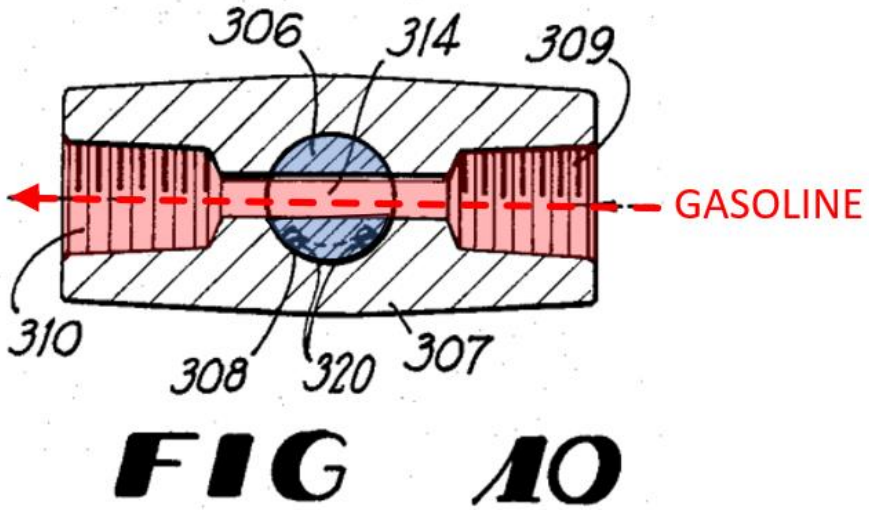


FIG 10

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

[0275]. As shown in FIG. 11 (below) when "propane" mode of control 301 is selected, spool 306 is rotated within valve body 307 by control cable 302 such that O-ring 308 on the face of spool 306 forms a seal between spool 306 and valve body 307 around liquid inlet opening 309. Ex. 1006, 8:3-7. Forming a seal between the spool 306 and valve body 307, prohibits the flow of gasoline to conventional carburetor 110. Ex. 1006, 8:7-10.

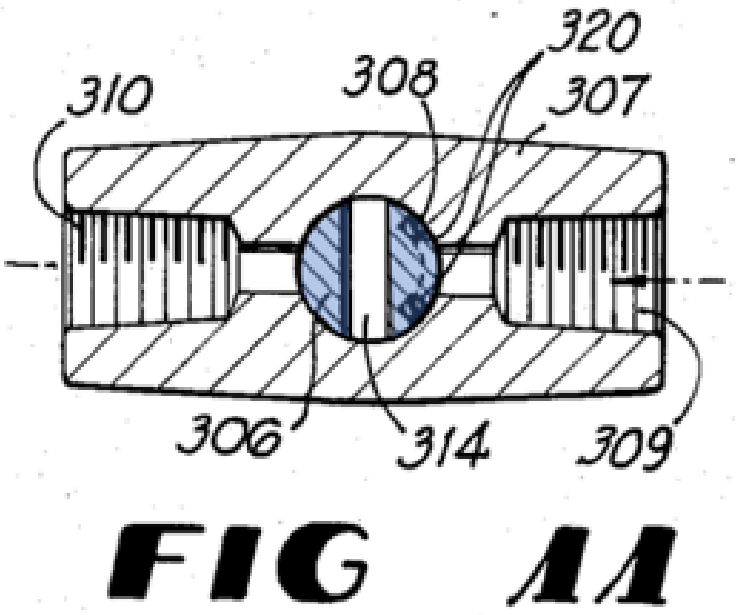
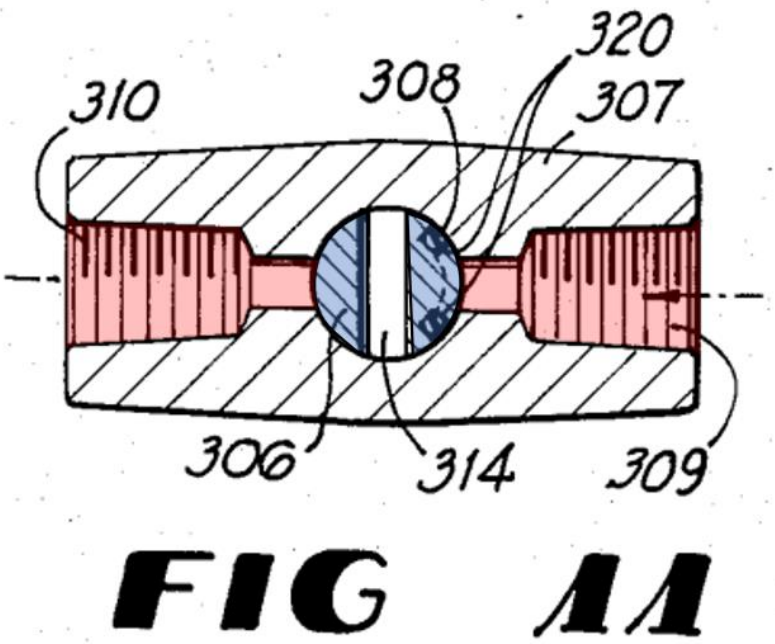


FIG 11

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

[0276]. A POSA would understand that during propane mode spool 306 is rotated within valve body 307 such that gasoline is prevented from flowing through liquid outlet opening 310. As shown in FIG. 11 below, when the mechanical fuel valve is in the second position (e.g. propane mode), the first fuel

source (e.g., gasoline) is prevented from communicating to the dual fuel engine via the first fuel line (e.g. liquid inlet opening 309 and liquid outlet opening 310).



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

[0277]. As shown in FIG. 13 (below), during "propane" mode of operation, duct 315 within spool 306 is simultaneously aligned to communicate with vacuum inlet port 311 and first vacuum outlet port 312. Ex. 1006, 8:23-26, Fig. 13. Communicating vacuum inlet port 311 with the first vacuum outlet port 312 connects converter vacuum line 30 (shown in FIG. 1) to the intake manifold, via intake manifold line 112. Ex. 1006, 8:26-30.

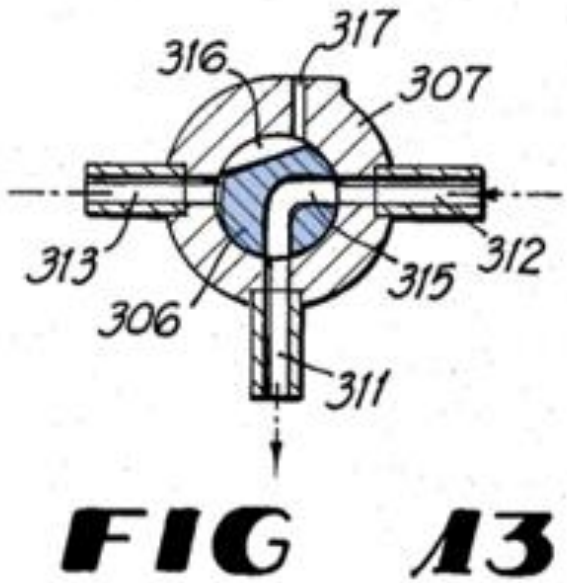
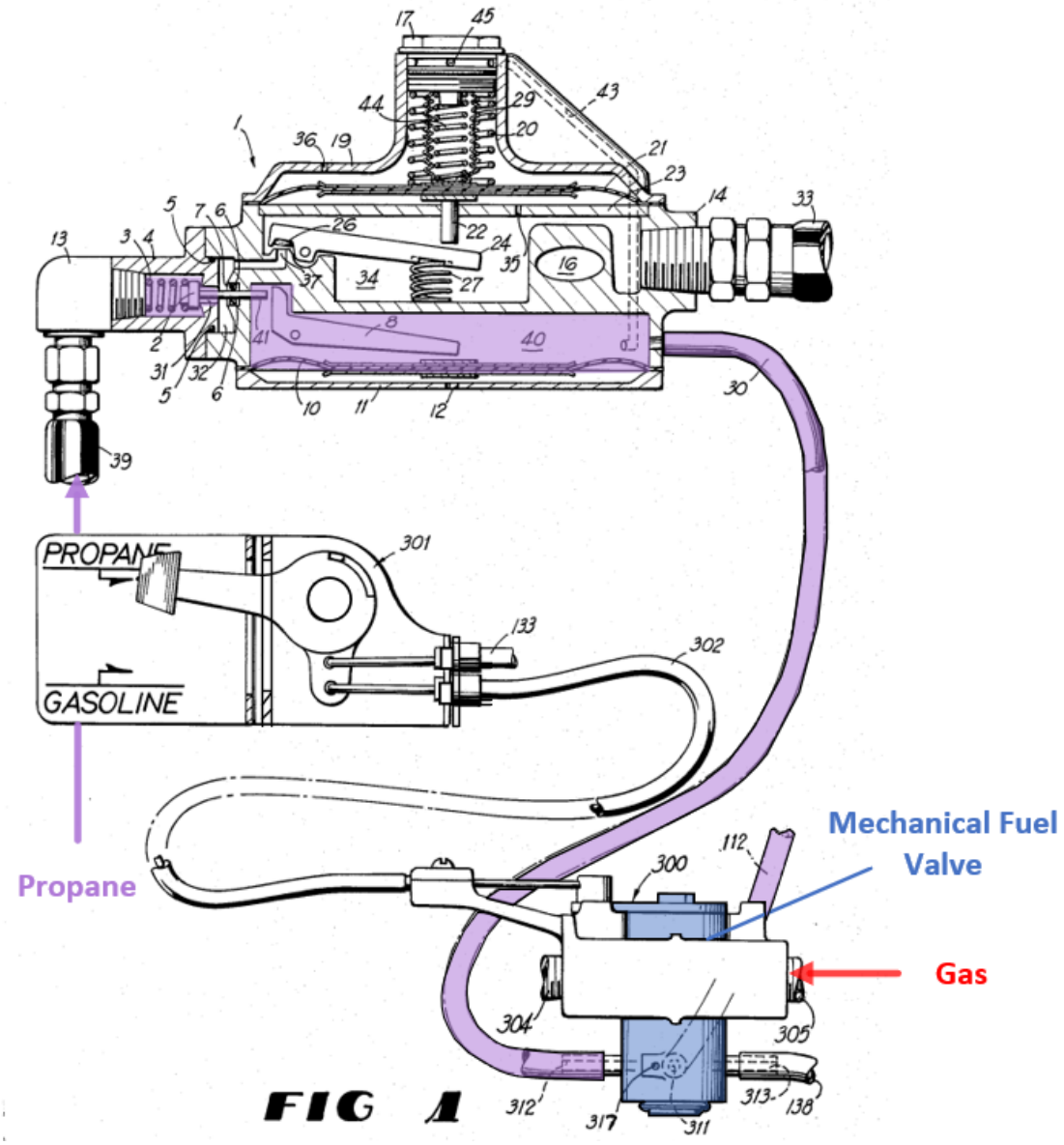


FIG 13

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

[0278]. During "propane" mode operation, when the engine is started, a vacuum is created in intake manifold vacuum line 112, and vacuum line 30, urging diaphragm 10 upward against liquid inlet lever 8. Ex. 1006, 8:31-38, FIG. 1. Actuating inlet lever 8 drives inlet valve shaft 41 against bias spring 3 which opens liquid inlet valve 2 allowing liquified gaseous fuel (propane) to flow through the propane fuel line to the engine. Ex. 1006, 8:38-42, FIG. 1. Figure 1 of Hallberg is reproduced below.



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

[0279]. A POSA would understand that actuating the mechanical fuel valve to a second position (e.g., propane) selectively controls the flow of fuel to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line.

[0280]. A POSA would therefore understand that the mechanical fuel valve is actuateable between a first position (e.g., gasoline) and a second position (e.g., propane) to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line.

[0281]. Accordingly, it is my opinion that a POSA would understand that Hallberg teaches *"a mechanical fuel valve actuateable between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line"* as recited in claim limitation [15a].

c. Element [15.2] a fuel lockout apparatus coupled to the mechanical fuel valve;

[0282]. It is my opinion that a POSA would understand that Hallberg discloses *"a fuel lockout apparatus coupled to the mechanical fuel valve"* as recited in claim limitation [15b].

[0283]. Claim limitation [15b] contains similar language to that of [1b]. My opinion that a POSA would understand that Hallberg discloses claim limitation [15b] is thus similar to that of claim limitation [1b].

[0284]. It is my understanding that an "apparatus," in its plain and ordinary meaning, is a "set of…equipment designed for a particular use." *Supra*,

§VI.A.1.c.i.i-1. Accordingly, it is my opinion that a POSA would understand that a fuel lockout apparatus includes at least two elements that together are designed for a particular use.

[0285]. It is also my understanding that the plain and ordinary meaning of the adjective "fuel lockout" is "preventing the flow of fuel." Therefore, it is my opinion that a POSA would understand that the plain and ordinary meaning of the composite term "fuel lockout apparatus" is a "set of…equipment designed" for "preventing the flow of fuel."

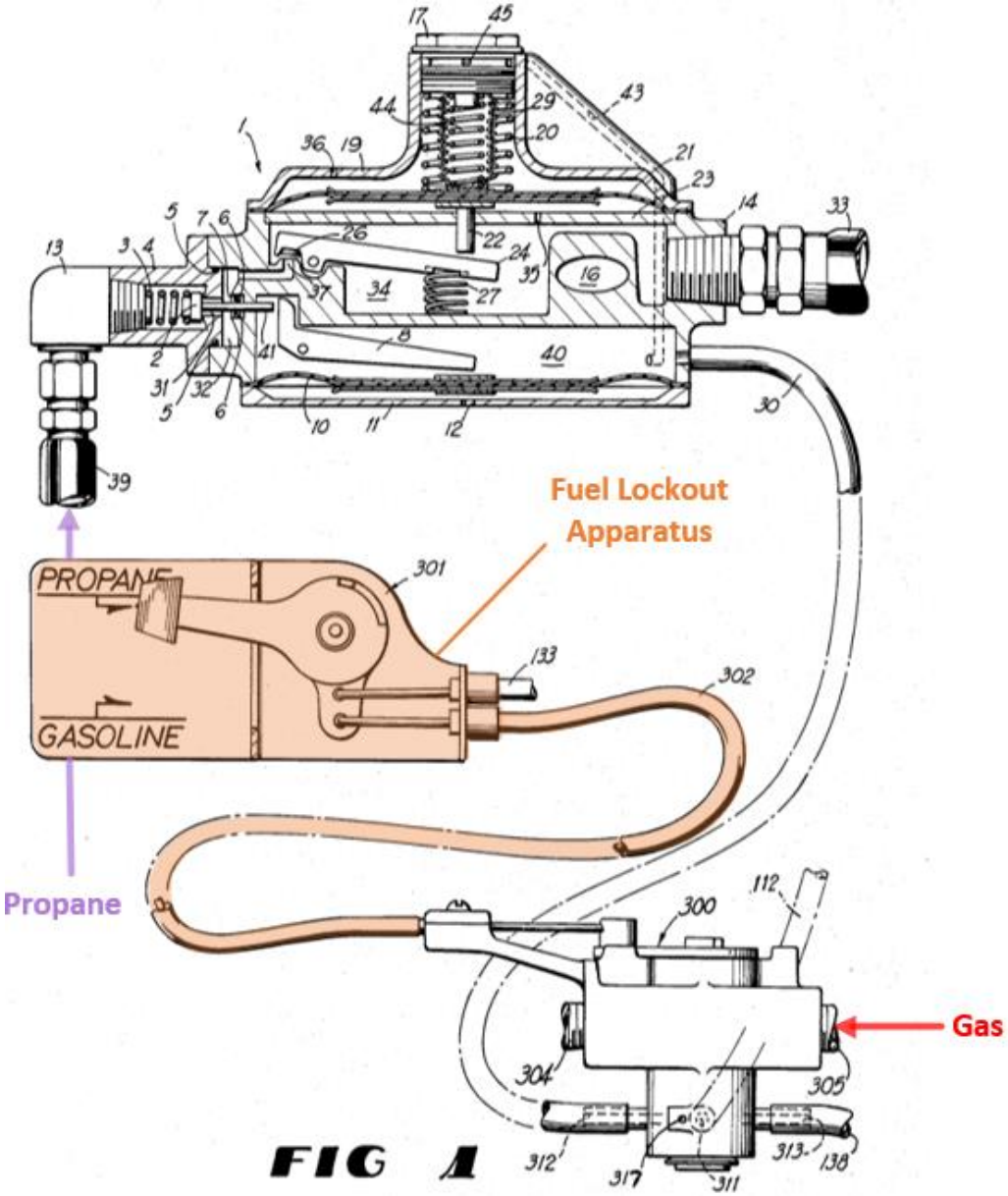
[0286]. It is also my understanding that the plain and ordinary meaning of "coupled" is "to join or combine." *Supra*, §VI.B. Accordingly, it my opinion that in the dual fuel engine mechanical fuel lockout switch art, a POSA would understand that the term "coupled," without further limitation in the specification or claims, would include "mechanically coupled," "fluidly coupled," or "hydraulically coupled."

[0287]. A POSA would also understand that Hallberg discloses a mechanical fuel valve. *Supra*, §VII.B.1.b. A POSA would also understand that Hallberg also discloses a structure that teaches a fuel lockout apparatus coupled to the mechanical fuel valve (fluid dual valve structure 300), the fuel lockout apparatus being configured to perform the function described in [15d] of claim 15 (discussed hereinafter in §VII.B.5.d).

[0288]. Hallberg discloses a fuel lockout apparatus comprising fluid dual value control 301 and control cable 302. Ex. 1006, 7:27-44. As shown in FIG. 1 (below), the fuel lockout apparatus comprising fluid dual value control 301 and control cable 302 is coupled to fluid dual valve structure 300. Ex. 1006, 7: 28-36 and 8:3-9.

[0289]. Positioning control 301 in the "gasoline" mode acts through control cable 302 to permit gasoline to flow through fluid dual valve structure 300, and to lock out propane from flowing through fluid dual valve structure 300. §VII.B.1.b, *supra*.

[0290]. Positioning control 301 in the "propane" mode acts through control cable 302 to permit propane to flow from propane supply port 39 to the mixer 100, and to lock out gasoline from flowing through fluid dual valve structure 300. §VII.B.1.b, *supra*.



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

[0291]. A POSA would understand that the components of the fuel lockout apparatus (fluid dual value control 301 and control cable 302) can be actuated and/or engaged to allow propane to flow through propane supply line 39 to the internal combustion engine.

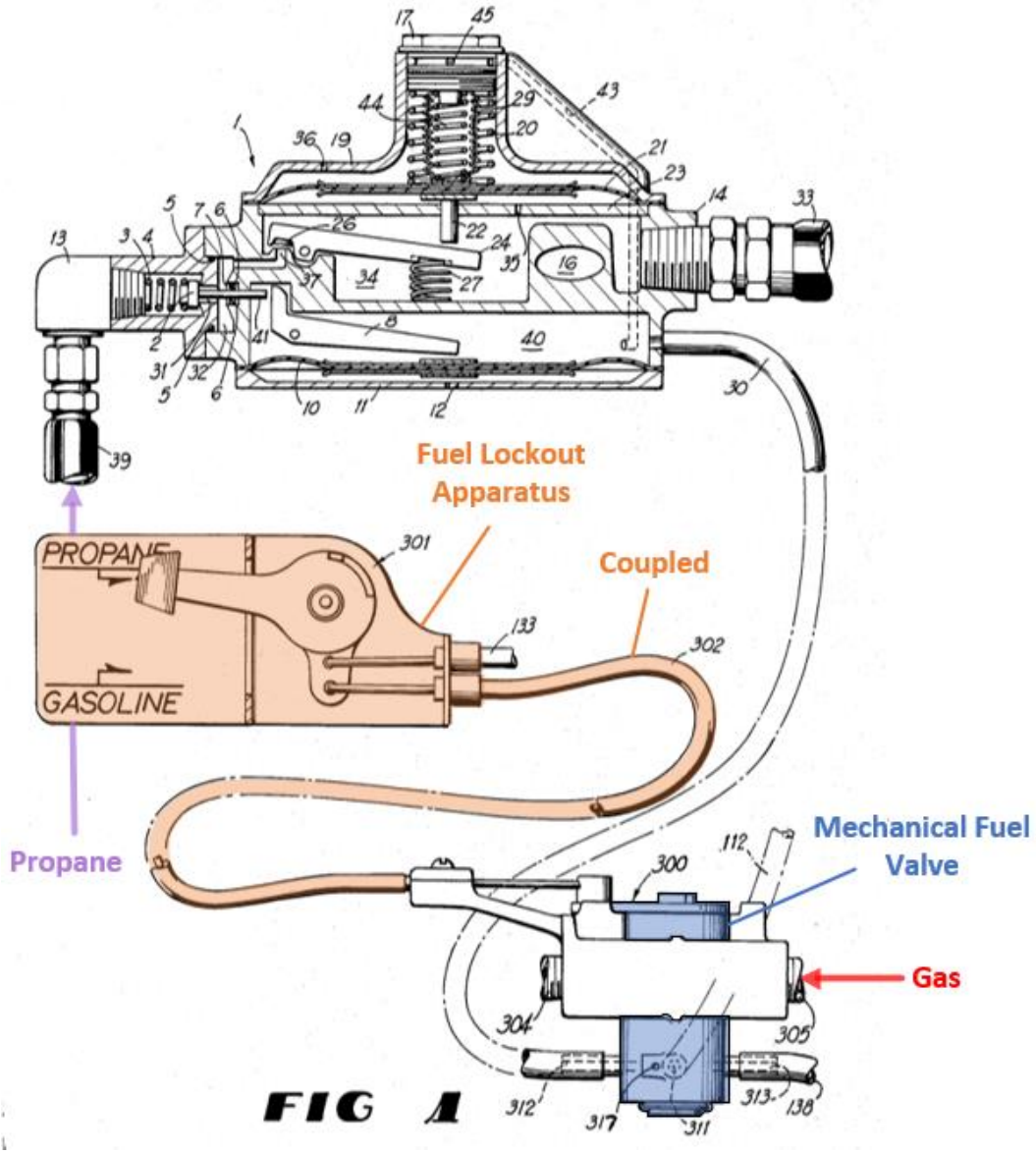
[0292]. If the components of the fuel lockout apparatus are not actuated and/or engaged, propane is not supplied to the dual fuel generator.

[0293].

[0294]. A POSA would understand that Hallberg discloses that the fuel lockout apparatus is coupled to the mechanical fuel valve.

[0295]. As discussed in §§VI.B, and VII.B.1.c., it is my understanding that "coupled" means "attached…" As shown in FIG. 1 (below), control cable 302 "attaches" the fuel lockout apparatus to the mechanical fuel valve.

[0296]. Without control cable 302, the fluid dual valve control 301 would be unable to rotate spool 306 within the valve body 307. Ex. 1006, 7:30-33.



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

[0297]. Accordingly, it is my opinion that a POSA would understand that Hallberg teaches *"a fuel lockout apparatus coupled to the mechanical fuel valve"* as recited in claim limitation [15b].

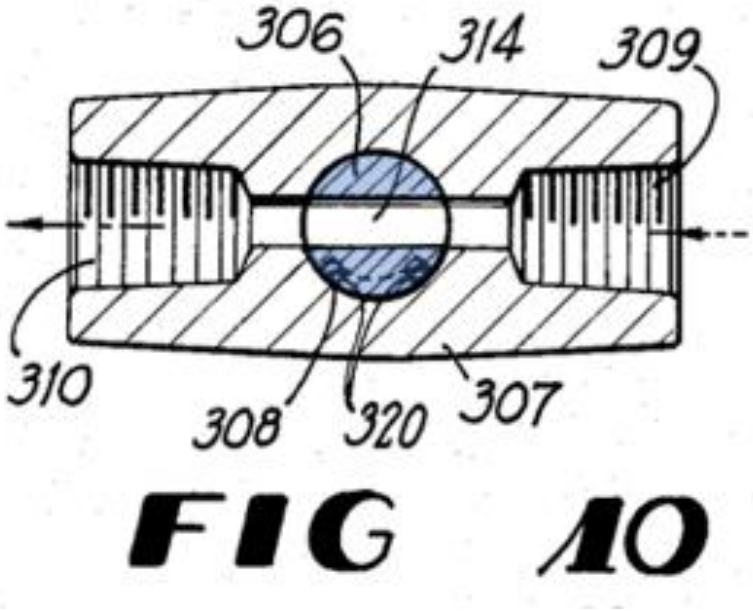
d. Element [15.3] wherein the mechanical fuel lockout switch: communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position; and

[0298]. It is my opinion that a POSA would understand that Hallberg discloses *"wherein the mechanical fuel lockout switch: communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position"* as recited in claim limitation[15c].

[0299]. Claim limitation [15c] contains similar language to that of [1c]. My opinion that a POSA would understand that Hallberg discloses claim limitation [15c] is thus similar to that of claim limitation [1c].

[0300]. Hallberg discloses that when gasoline is selected on the fluid dual valve control 301, spool 306, within valve body 307, is rotated such that gasoline from gasoline supply line 304 is supplied to the carburetor 110 through engine gasoline line 305. Ex. 1006, 7:27-44.

[0301]. As shown in FIG. 10 below, when gasoline is selected, gasoline is communicated through inlet opening 309, tunnel 314 and liquid outlet opening 310.



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

[0302]. During gasoline mode, the fuel lockout apparatus prevents the flow of propane to the internal combustion engine. *Supra*, §VII.B.1.c. It is my understanding that when the mechanical fuel valve is in the first position (gasoline mode), the mechanical fuel lockout switch communicates the first fuel (gasoline) source to the dual fuel engine and prevents communication between the second fuel (propane) source and the dual fuel engine.

[0303]. When propane mode is selected on the fluid dual valve control 301, propane is provided to the dual fuel engine. Ex. 1006, 8:3-57. As described

in §§VII.B.1.b, VII.B.1.c, *supra,* when propane mode is selected, spool 306 is rotated within valve body 307 to form a seal to prevent the flow of gasoline to the engine and a vacuum is created in line 30, urging diaphragm 10 upward against liquid inlet lever 8 which drives fuel 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.

[0304]. A POSA would therefore understand that when the mechanical fuel valve is in a second position (propane mode), the mechanical fuel lockout switch communicates the second fuel (propane) source to the dual fuel engine and interrupts the first fuel (gasoline) source communication with the dual fuel engine.

[0305]. Accordingly, it is my opinion that a POSA would understand that Hallberg teaches *"wherein the mechanical fuel lockout switch: communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position"* as recited in claim limitation[15c].

e. Element [15.4] wherein the fuel lockout apparatus prevents actuation of the mechanical fuel valve to the first position when the second fuel source communicates with the dual fuel engine.

[0306]. It is my opinion that a POSA would understand that Hallberg discloses "*wherein the fuel lockout apparatus prevents actuation of the mechanical fuel valve to the first position when the second fuel source communicates with the dual fuel engine"* as disclosed in limitation [15d].

[0307]. Claim limitation [15d] contains similar language to that of claim 2. My opinion that a POSA would understand that Hallberg discloses claim limitation [15d] is thus similar to that of claim 2.

[0308]. A POSA would understand that Hallberg discloses astructure, that teaches a fuel lockout apparatus. *Supra*, §VII.B.1.c. First, Hallberg discloses a fuel lockout apparatus comprising fluid dual valve control 301 and control cable 302. *Supra,* §VII.B.1.c.

[0309]. The fluid dual valve control 301 and control cable 302 can be actuated and/or engaged to allow either gasoline or propane to flow to the internal combustion engine. *Supra,* §VII.B.1.c. A POSA would understand that the valve control 301 will be in "either" the first position (gasoline) "or" the second position (propane).

[0310]. Positioning valve control 301 in the first position (gasoline mode), acts through control cable 302, to rotate spool 306 within valve body 307 to permit gasoline (e.g., a first fuel) to flow through fluid dual valve structure 300

(e.g., a mechanical fuel valve) and lock out propane (e.g., a second fuel) from flowing through fluid dual valve structure 300. *Supra,* §VII.B.1.b.

[0311]. Positioning control 301 in the second position (propane mode), acts through control cable 302, to rotate spool 306 within valve body 307, to create a vacuum in line 30, which opens liquid inlet valve 2, allowing propane to flow through the propane fuel line to the engine. Ex. 1006, 8:38-42.

[0312]. A POSA would therefore understand that while in the second position, the valve control 301 cannot be obviously in the first position. By selecting the valve control 301 in the second position, the first position cannot be actuated. In other words, putting the valve control 301 in the second position, prevents actuation to the first position.

[0313]. Moreover, as I discussed in §VII.B.2., when propane is communicated to the engine and vacuum is provided to the fuel lockout apparatus via vacuum line 30, the rotatable spool cannot be in a gasoline position as it is well known in the art that when a valve is in a first position, it cannot be in a second position.

[0314]. A POSA would therefore understand that the fuel lockout apparatus therefore prevents actuation of the mechanical fuel valve to a first position (i.e., gasoline) when propane is communicated to the dual fuel engine.

[0315]. Accordingly, it is my opinion that a POSA would understand that the fuel lockout apparatus prevents actuation of the mechanical fuel valve to the first position when the second fuel source communicates with the dual fuel engine.

[0316]. A POSA would understand that when the valve control 301 is in gasoline mode, vent 317 communicates with the atmosphere. Ex. 1006, 7:36-38. A POSA would understand that spool 306 is thus prevented from actuating to propane mode whereby the spool 306 is aligned to communicate with the intake manifold line 112 via vacuum inlet port 311. Ex. 1006, 8:23-30.

[0317]. A POSA would understand that if vacuum line 30 is not activated, fuel inlet valve 2 of the fuel lockout apparatus would remain closed, preventing the propane supply line from coupling to propane supply. Moreover, when gasoline mode is selected, control cable 302 activates spool 306 within the dual valve 300 to allow gasoline to flow to the internal combustion engine. Supra, §§VII.B.1.b, VII.B.1.d.

[0318]. As discussed in §§VII.B.1.b, VII.B.1.c, VII.B.1.d, supra, when propane mode is selected, the mechanical fuel valve is in second position, and a vacuum is created in line 30, urging diaphragm 10 upward against liquid inlet lever 8, which drives fuel inlet valve shaft 41 against bias spring 3, which opens liquid

inlet valve 2 allowing propane to flow through the propane fuel line to the engine. Ex. 1006, 8:38-42.

[0319]. Accordingly, it is my opinion that a POSA would understand that Hallberg teaches and/or suggests "*wherein the fuel lockout apparatus prevents actuation of the mechanical fuel valve to the first position when the second fuel source communicates with the dual fuel engine"* as disclosed in limitation [15d].

C. Ground 3: The Combination of Rumao, DuroMax, and Elsdon, and alternatively the Combination of Rumao and Hallberg Renders Obvious Claims 8, 9, 11, and 14.

[0320]. As discussed in §VII.A, *supra*, claims 1, 3, 4, 6, 7, and 15 are rendered obvious by the combination of DuroMax and Elsdon. Claims 1, 6 and 7 are also anticipated under §102 by Hallberg (Ground 2A) and claims 2 and 15 are rendered obvious under §103 by Hallberg (Ground 2B). *Supra*, §VII.B. Claims 8, 9, 11, and 14 include limitations similar to those of claims 1, 2, 6, 7, and 15. A POSA would have looked to Rumao to teach, and render obvious, any limitation not disclosed by the combination of DuroMax and Elsdon, and alternatively, Hallberg.

1. Independent claim 8

a. Element [8.0]: "A method of assembling a mechanical fuel lockout switch for an internal combustion engine comprising:"

[0321]. To the extent the preamble is limiting, the combination of Rumao, DuroMax, and Elsdon teaches element [8.0]. Alternatively, the combination of Rumao and Hallberg teaches element [8.0].

[0322]. Rumao discloses methods of assembling generators including internal combustion engines powered by propane or gasoline. Ex.1007, Abstract; Ex.1007, 5:6-12.

[0323]. The combination of DuroMax and Elsdon discloses a mechanical fuel lockout switch for an internal combustion engine. *Supra*, §VII.A. Alternatively, Hallberg discloses a mechanical fuel lockout switch for an internal combustion engine. *Supra,* §VII.B.

[0324]. Accordingly, a POSA would have understood that Rumao, DuroMax, and Elsdon could be combined to teach a method of assembling a mechanical fuel lockout switch for an internal combustion engine.

[0325]. Alternatively, a POSA would have understood that Rumao and Hallberg could be combined to teach a method of assembling a mechanical fuel lockout switch for an internal combustion engine.

b. Element [8.1]: "providing an internal combustion engine configured to operate on a fuel from a first fuel source and a different fuel from a second fuel source;"

[0326]. The combination of Rumao and DuroMax, and alternatively, Rumao and Hallberg teaches [8.1]. Rumao discloses methods of assembling a

generator. *Supra*, §VII.C.1.a. In one configuration (see FIG. 82 below), the generator includes permanent fuel tank 360 (i.e., a primary fuel source) and removable fuel tank 380 (i.e., a secondary fuel source). Ex.1007, 18:34-36, FIG. 82.

[0327]. A POSA would therefore have understood that Rumao discloses assembling an internal combustion engine that, in one configuration, operates on a first fuel (e.g., gasoline) from a first fuel source (e.g., permanent fuel tank 360 and/or removable fuel tank 380), and in a second configuration, operates on a second fuel (e.g., propane) from a second fuel source.

[0328]. DuroMax also discloses an internal combustion engine operable alternately on gasoline or propane. *Supra*, §VII.A.1.a. A POSA would have understood that the internal combustion engine of DuroMax can be combined with the methods of assembling generators of Rumao to teach element [8.1].

[0329]. Alternatively, a POSA would have looked to Hallberg. Hallberg also discloses a conventional internal combustion engine operable on a liquified gas fuel (e.g., propane) and a liquid fuel (e.g., gasoline). Ex.1006, 1:6-12.

[0330]. Accordingly, a POSA would have understood that the internal combustion engine of Hallberg can be combined with the method of assembling generators of Rumao to teach element [8.1].

c. Element [8.2]: "coupling a mechanical fuel valve to the internal combustion engine actuateable between a first position and a second position to selectively control fuel flow to the internal combustion engine from the first fuel source through a first fuel line and the second fuel source through a second fuel line; and"

[0331]. Rumao discloses methods of assembling a generator system comprising engine 311 and "other accessories for forming a fully functional generator." Ex.1007, 18:34-40. A POSA would have understood that "other accessories for forming a fully functional generator" for the case of a dual fuel generator include a mechanical fuel valve that selectively controls fuel flow of propane or gasoline to the internal combustion engine.

[0332]. DuroMax describes a mechanical fuel valve that is actuatable between an open and closed position in which gasoline is selectively permitted to flow through a gasoline fuel line. *Supra*, §VII.A.1.b. The mechanical fuel valve is coupled to the internal combustion engine. Ex.1004, pp.7-8. A POSA also would have found it obvious to combine the Elsdon fuel conduit coupler cap with the mechanical fuel valve of DuroMax to have enabled the mechanical fuel valve of DuroMax to further control the flow of LPG fuel through the LPG fuel conduit coupler via cap 16. *Supra*, §VII.A.1.b.

[0333]. A POSA would have understood that the mechanical fuel valve of DuroMax coupled to the internal combustion engine of DuroMax can be

combined with the methods of assembling generators of Rumao (discussed hereinafter in §VII.C.1.d.i-ii) to teach element [8.2].

[0334]. Alternatively, Hallberg discloses a mechanical fuel valve actuateble between a first position and a second position to selectively control fuel flow from a first fuel source through a first fuel line and a second fuel source through a second fuel line to a dual fuel engine. *Supra,* §VII.B.1.b. Hallberg also discloses that the mechanical fuel valve is coupled to the internal combustion engine. *Supra,* §VII.B.1.b.

[0335]. As shown in FIG. 10 of Hallberg (see below), the mechanical fuel valve is coupled to liquid outlet opening 310. Ex.1006, FIG. 10.

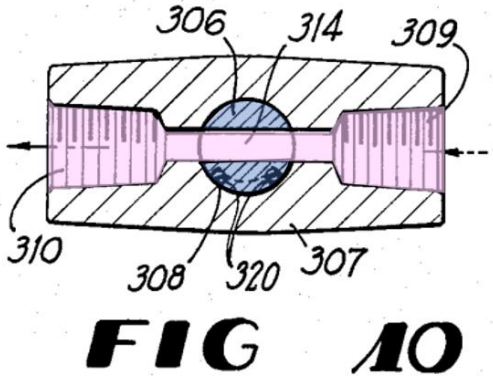
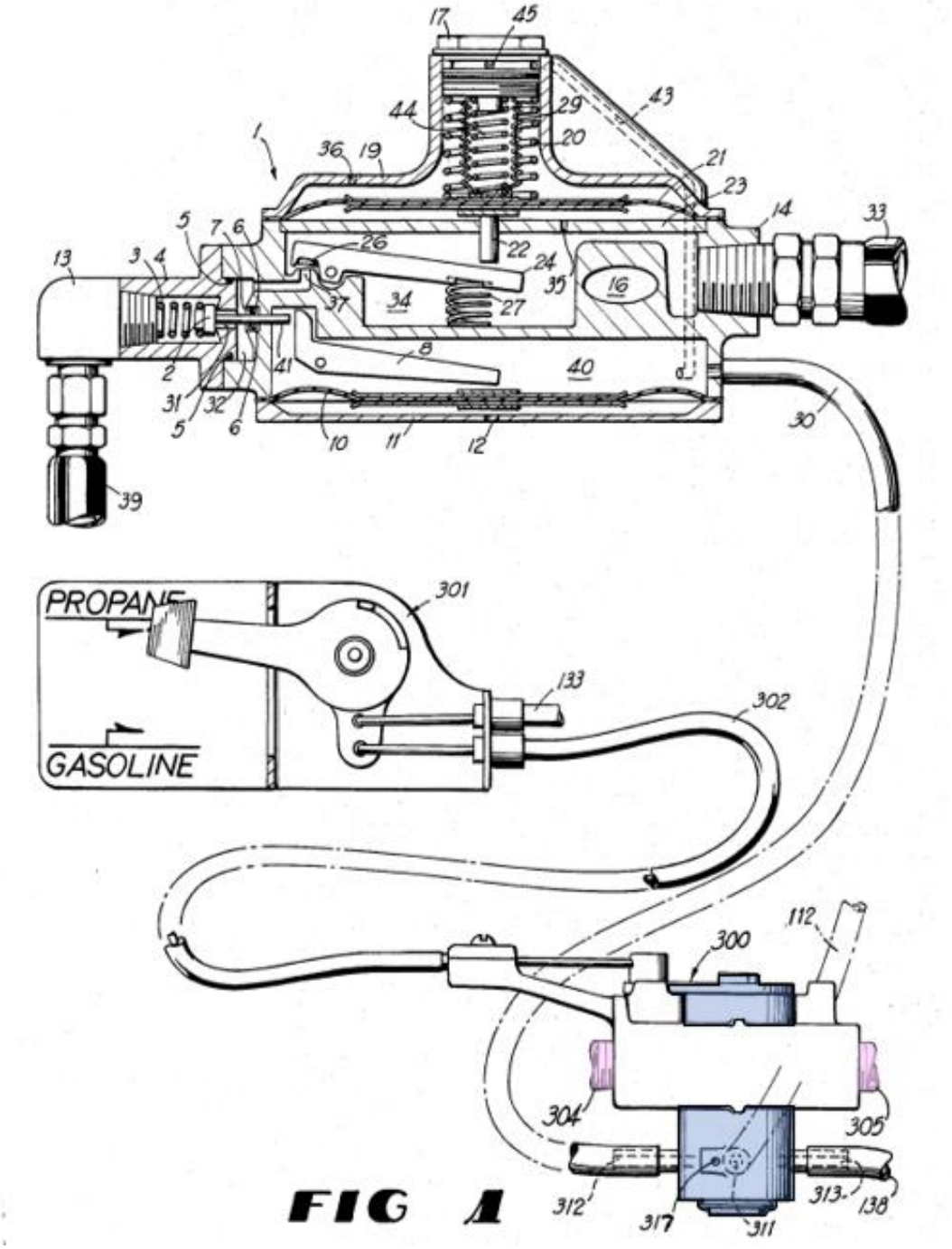


FIG 10

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

[0336]. FIGS. 1 and 9 of Hallberg (below) further disclose that the liquid outlet opening 310 is coupled to gasoline line 305. Ex.1006, FIGS. 1,9. Gasoline from gasoline supply line 304 is supplied to the carburetor 110 through engine gasoline line 305. Ex.1006, 7:39-43.



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

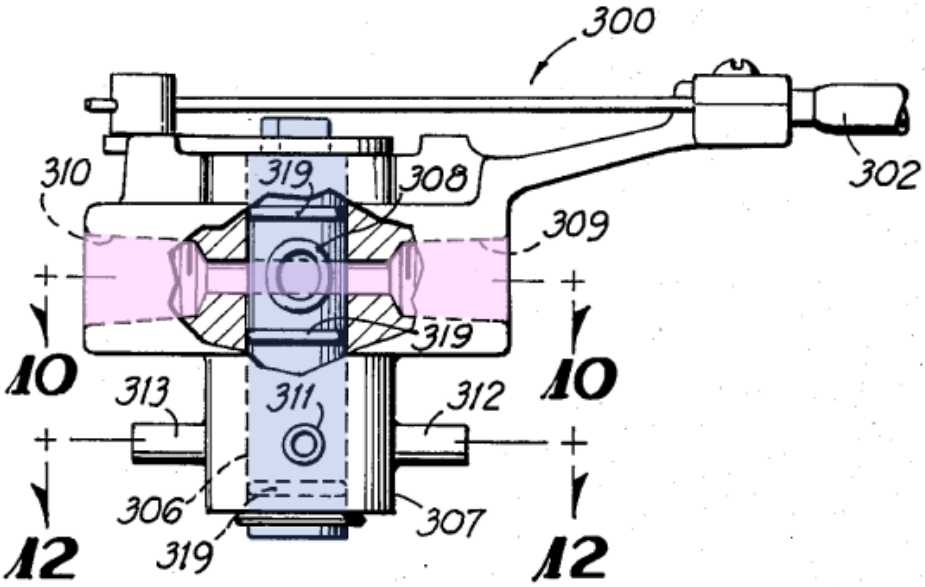


FIG 9

Ex.1006, FIGS. 1, 9 (Emphasis Added).

[0337]. Accordingly, a POSA would have understood that the mechanical fuel valve and internal combustion engine of Hallberg can be combined with the methods of assembling generators of Rumao (discussed hereinafter in §§VII.C.1.i-ii) to teach element [8.2].

d. Element [8.3]: "coupling a fuel lockout apparatus to the mechanical fuel valve;"

[0338]. The combination of Rumao, DuroMax and Elsdon, or alternatively, Rumao and Hallberg, teaches [8.3].

[0339]. Rumao discloses a method of assembling a generator system that includes "other accessories for forming a fully functional generator." *Supra*,

§VII.C.1.c. A POSA would have understood that "other accessories for forming a fully functional generator" for the case of a dual fuel generator include a fuel lockout apparatus configured to communicate the first fuel source to the internal combustion engine and prevent the second fuel source from coupling to the internal combustion engine when the mechanical fuel valve is in the first position, and vice versa.

[0340]. Elsdon discloses a fuel lockout apparatus. *Supra,* §VII.A.1.c. A POSA would have been motivated to combine the fuel lockout apparatus of Elsdon with the mechanical fuel valve of DuroMax to provide a fuel lockout apparatus coupled to the mechanical fuel valve. *Supra* §§VII.A.1.a.1-2.

[0341]. A POSA would have therefore understood that the fuel lockout apparatus of Elsdon, coupled to the mechanical fuel valve of DuroMax, can be combined with the methods of assembling generators of Rumao to teach element [8.3] (discussed hereinafter in §§VI.D.2.f.i-ii).

[0342]. Alternatively, Hallberg discloses a structure which teaches a fuel lockout apparatus coupled to the mechanical fuel valve. *Supra,* §VII.B.1.c. Hallberg discloses a fuel lockout apparatus comprising fluid dual valve control 301 and control cable 302 that is coupled to a mechanical fuel valve. *Id.*

[0343]. A POSA would have understood that the fuel lockout apparatus coupled to the mechanical fuel valve of Hallberg can be combined with the

methods of assembling generators of Rumao to teach the step of [8.3] (discussed hereinafter in §§VII.C.1.d.i-ii).

i. Motivation to Combine Rumao, DuroMax, and Elsdon, and alternatively, Rumao and Hallberg, Elsdon.

[0344]. Rumao, DuroMax, Elsdon, and Hallberg, all relate to internal combustion engines. Ex.1004, pp.2-5; Ex.1005, 6:35-52; Ex.1006, 1:6-8; Ex.1007, 5:6-10. The internal combustion engines of Hallberg and DuroMax are operable on propane or gasoline. Ex.1004, pp.11-12; Ex.1006, 29:28-33.

[0345]. Rumao discloses methods of assembling a generator system. Ex.1007, Abstract. The generator system includes "other accessories for forming a fully functional generator." *Supra*, §VII.C.1.c.

[0346]. A POSA would have understood that "other accessories for forming a fully functional generator" for the case of a dual fuel generator include a mechanical fuel valve to selectively control fuel flow of propane or gasoline that is coupled to the internal combustion engine, and a fuel lockout apparatus configured to prevent the second fuel source from coupling to the second fuel line while the mechanical fuel valve is in the first position and permit the second fuel source to couple to the second fuel line while the mechanical fuel valve is in the second position.

[0347]. DuroMax discloses a mechanical fuel valve that is actuatable between open and closed positions in which gasoline is selectively permitted to flow through a gasoline fuel line. *Supra*, §VII.A.1.b.

[0348]. Hallberg discloses a mechanical fuel valve actuatable between a first position and second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line. *Supra*, §VII.B.1.b.

[0349]. A POSA would have therefore been motivated to combine the mechanical fuel valve of either DuroMax or Hallberg with the methods of assembling a generator system of Rumao.

[0350]. Elsdon discloses a fuel lockout apparatus, comprising a cap and shield. *Supra*, §VII.A.1.c. A POSA would have found it obvious to combine the Elsdon fuel conduit coupler cap with the gasoline valve of DuroMax to have enabled the gasoline valve of DuroMax to further control the flow of LPG fuel through the LPG fuel conduit coupler via the cap 16. *Supra*, §VII.A.1.b.

[0351]. Alternatively, Hallberg discloses a fuel lockout apparatus comprising fluid dual valve control 301 and control cable 302. *Supra*, §VII.B.1.c.

[0352]. A POSA would have understood that the fuel lockout apparatuses of Elsdon and Hallberg are configured to prevent the second fuel source from coupling to the second fuel line while the mechanical fuel valve is in

the first position and permit the second fuel source to couple to the second fuel line while the mechanical fuel valve is in the second position. *Supra*, §§VII.A.1.c, VII.B.1.c.

[0353]. A POSA would have therefore been motivated to combine the fuel lockout apparatus of Elsdon, and alternatively, Hallberg with the methods of assembling a generator system of Rumao.

ii. Reasonable Expectation of Success

[0354]. A POSA would have had a reasonable expectation of success in using the method of Rumao to assemble a generator with the fuel lockout apparatus of Elsdon and mechanical fuel valve of DuroMax.

[0355]. As of the date that the application that became ’780 Patent was filed, the assembly of dual fuel generators was well known in the art, with Rumao and DuroMax being just two examples. A POSA would have therefore reasonably expected that the fuel lockout apparatus of Elsdon and the mechanical fuel valve of DuroMax could be successfully implemented in the methods of assembling a generator system as disclosed in Rumao and discussed in §§VII.C.1.a-b.

[0356]. A POSA would have also had a reasonable expectation of success in using the methods of Rumao to assemble a generator with the fuel lockout apparatus and mechanical fuel valve of Hallberg. The assembly of dual

fuel generators was well known in the art, as of the date that the application that became ’780 Patent was filed, with Rumao being just one example.

[0357]. A POSA would have therefore reasonably expected that the mechanical fuel valve and fuel lockout apparatus of Hallberg could be successfully implemented in the methods of assembling a generator system disclosed in Rumao.

e. Element [8.4]: “wherein when the mechanical fuel valve is in the first position, the fuel lockout apparatus communicates the first fuel source to the internal combustion engine and prevents the second fuel source from coupling to the internal combustion engine, and actuation of the mechanical fuel valve to the second position causes the fuel lockout apparatus to permit the second fuel source to couple to the internal combustion engine, and interrupts the first fuel source communication with the internal combustion engine; and”

[0358]. The combination of Rumao, DuroMax, and Elsdon, and alternatively, Rumao and Hallberg teaches element [8.4].

[0359]. A POSA would have understood that the combination of DuroMax and Elsdon discloses a mechanical fuel lockout switch comprising a mechanical fuel valve. *Supra*, §VII.A.1.b. A POSA would have understood that Elsdon discloses a fuel lockout apparatus that, when coupled to a mechanical fuel valve disclosed in DuroMax, selectively controls the flow of fuel. *Supra*, §VII.A.1.c.

[0360]. A POSA would have also understood that when the mechanical fuel valve is in the first position, the fuel lockout apparatus communicates the first

fuel source to the engine and prevents communication between the second fuel source and the engine. *Supra,* §§VII.A.1.d-e.

[0361]. When the mechanical fuel valve is in a second position, the fuel lockout apparatus communicates the second fuel source to the engine and interrupts the first fuel source communication with the engine. *Id.*

[0362]. A POSA would have therefore understood that the combination of Rumao, DuroMax, and Elsdon teaches a method of assembling a mechanical fuel lockout switch where a fuel lockout apparatus communicates the first fuel source to the internal combustion engine and prevents the second fuel source from coupling to the internal combustion engine when the mechanical fuel valve is in the first position.

[0363]. A POSA would have also understood that actuation of the mechanical fuel valve to the second position causes the fuel lockout apparatus to permit the second fuel source to couple to the internal combustion engine and interrupt the first fuel source communication with the internal combustion engine.

[0364]. Hallberg discloses a mechanical fuel valve coupled to a fuel lockout apparatus. *Supra,* §VII.B.1.c. When the mechanical fuel valve is in the first position, the fuel lockout apparatus communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine. *Supra,* §VII.B.1.d. When the mechanical fuel valve is in a

second position, the fuel lockout apparatus communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine. *Supra,* §VII.B.1.d.

[0365]. A POSA would have understood that the combination of Rumao and Hallberg discloses a method of assembling a mechanical fuel lockout switch where a fuel lockout apparatus communicates the first fuel source to the internal combustion engine and prevents the second fuel source from coupling to the internal combustion engine when the mechanical fuel valve is in the first position.

[0366]. A POSA also would have understood that actuation of the mechanical fuel valve to the second position causes the fuel lockout apparatus to permit the second fuel source to couple to the internal combustion engine and interrupt the first fuel source communication with the internal combustion engine.

f. Element [8.5]: "wherein the fuel lockout apparatus prevents actuation of the mechanical fuel valve to the first position when the second fuel source is coupled to the internal combustion engine."

[0367]. The combination of Rumao, DuroMax and Elsdon, and alternatively, Rumao and Hallberg, teaches [8.5].

[0368]. As discussed in §VII.A.2, *supra*, a POSA would have understood that the combination of the fuel lockout apparatus of Elsdon and the

mechanical fuel valve of DuroMax discloses a fuel lockout apparatus that prevents actuation of the mechanical fuel valve to the first position when the second fuel source is coupled to the internal combustion engine.

[0369]. As discussed in §VII.B.2, *supra*, Hallberg discloses a fuel lockout apparatus that prevents actuation of the mechanical fuel valve to the first position when the second fuel source is coupled to the internal combustion engine.

[0370]. Accordingly, a POSA would have understood that the combination of Rumao, DuroMax and Elsdon, and alternatively, Rumao and Hallberg, teaches a method of assembling a mechanical fuel lockout switch where the fuel lockout apparatus prevents actuation of the mechanical fuel valve to the first position when the second fuel source is coupled to the internal combustion engine fuel lockout apparatus that communicates the first fuel source to the internal combustion engine.

2. Claim 9: "The method of claim 8, wherein the fuel lockout apparatus is further configured to: prevent coupling of the second fuel source to the second fuel line while the mechanical fuel valve is in the first position; and permit coupling of the second fuel source to the second fuel line while the mechanical fuel valve is in the second position."

[0371]. The combination of Rumao, DuroMax, and Elsdon, and alternatively, Rumao and Hallberg teaches claim 9.

[0372]. As discussed in §VII.A.1.c, *supra*, the combination of Elsdon and DuroMax discloses a fuel lockout apparatus that prevents the second fuel source from coupling to the second fuel line while the mechanical fuel valve is in the first position and permits the second fuel source to couple to the second fuel line while the mechanical fuel valve is in the second position.

[0373]. As discussed in §VII.B.1.c, *supra*, Hallberg discloses a fuel lockout apparatus that prevents the mechanical fuel valve from coupling to the second fuel source when the mechanical fuel valve is in the first position and permits the second fuel source to couple with the second fuel line when the mechanical fuel valve is in the second position.

[0374]. Accordingly, a POSA would have understood that the combination of Rumao, DuroMax, and Elsdon, and alternatively, Rumao and Hallberg, teaches claim 9.

3. Claim 11: "The method of claim 8, further comprising coupling a fuel regulator system to the second fuel source to reduce fuel pressure therefrom and deliver fuel to the second fuel line at a pressure required for operation of the internal combustion engine."

[0375]. The combination of Rumao, DuroMax, and Elsdon, and alternatively, Rumao and Hallberg teaches claim 11.

[0376]. Rumao discloses methods of assembling generators that includes "an engine configured to operate on a gaseous fuel source and…all related

appurtenances and accessories necessary for a fully functional generator system (e.g., … pressure regulators)." Ex.1007, 29:20-33. For example, Rumao discloses that "the backpack generator 500 may include…pressure regulators 512…and other appurtenances and accessories for a fully functional generator system. Ex.1007, 29:45-51.

[0377]. A POSA would have understood that a "pressure regulator" is a "fuel regulator system … to reduce fuel pressure … and deliver fuel … at a pressure required for operation of the internal combustion engine."

[0378]. A POSA would have thus understood that Rumao discloses the step of "coupling a fuel regulator system to the second fuel source to reduce fuel pressure therefrom and deliver fuel to the second fuel line at a pressure required for operation of the internal combustion engine."

[0379]. Accordingly, a POSA would have understood that the combination of Rumao, DuroMax, and Elsdon, and alternatively, Rumao and Hallberg teaches claim 11.

4. Claim 14: "The method of claim 8, further comprising providing gasoline in a liquid fuel tank as the first fuel source and LPG in a pressurized fuel container as the second fuel source."

[0380]. The combination of Rumao and DuroMax, or alternatively, Rumao and Hallberg discloses claim 14.

[0381]. Rumao discloses methods of assembling generators that includes internal combustion engines powered by propane or gasoline. *Supra*, §VII.C.1.a.

[0382]. In the event that a Rumao does not explicitly disclose providing gasoline as a first fuel source and LPG as a second source, DuroMax discloses gasoline tank and propane tank Ex.1004, p.1. A POSA would have understood that the gasoline is stored in a liquid fuel tank, and propane is stored in a pressurized fuel container. *Id.*



Ex.1001, p.1

[0383]. A POSA would have therefore understood that the gasoline tank and propane tank of DuroMax can be combined with the method of assembling a generator of Rumao to disclose the step of providing gasoline in a liquid fuel tank as the first fuel source and LPG in a pressurized fuel container as the second fuel source.

[0384]. Accordingly, a POSA would have understood that the combination of Rumao and DuroMax teaches claim 14.

[0385]. Alternatively, Hallberg discloses a propane fuel source and gasoline fuel source supplied to the dual fuel generator. *Supra*, §VII.B.1.b. A POSA would have understood that the gasoline fuel source is stored in a liquid fuel tank, and the propane fuel source is stored in a pressurized fuel container.

[0386]. A POSA would have thus understood that the propane fuel source and gasoline fuel source of Hallberg can be combined with the method of assembling a mechanical fuel lockout switch for an internal combustion engine of Rumao to disclose a method of assembling a mechanical fuel lockout switch for an internal combustion engine further comprising providing gasoline in a liquid fuel tank as the first fuel source and LPG in a pressurized fuel container as the second fuel source.

[0387]. Accordingly, a POSA would have understood that the combination of Rumao and Hallberg also teaches claim 14.

D. Ground 4: The Combination of Rumao, DuroMax, Elsdon, and Parlatore, or alternatively, Rumao, Hallberg, and Parlatore Renders Obvious Claims 12 and 13.

[0388]. As discussed in §VII.C, *supra*, a POSA would have understood that claims 8, 9, 11 and 14 are rendered obvious by the combination of Rumao, DuroMax, and Elsdon, or alternatively the combination of Rumao and Hallberg. Claims 12 and 13 depend from claim 11 which depends from claim 8. A POSA would have looked to Parlatore to teach, and render obvious, any limitation not disclosed by the combination of Rumao, DuroMax and Elsdon, or alternatively, Rumao and Hallberg.

1. Claim 12: "The method of claim 11, further comprising: mounting the fuel regulator system to the second fuel source located off-board the internal combustion engine."

[0389]. The combination of Rumao, DuroMax, Elsdon, and Parlatore, or alternatively, Rumao, Hallberg and Parlatore, teaches claim 12.

[0390]. Rumao discloses a method of assembling generators that includes "an engine configured to operate on a gaseous fuel source and…all related appurtenances and accessories necessary for a fully functional generator system (e.g., … pressure regulators)." Ex.1007, 29:20-33. A POSA would have understood that "all related appurtenances and accessories necessary for a fully functional generator system" includes a fuel regulator system. A POSA would also

have understood that the fuel regulator system can be mounted onto an LPG tank and located off-board the internal combustion engine. *Id.*

[0391]. In the event that Rumao does not explicitly disclose the aforementioned limitation, a POSA would have looked to Parlatore. Parlatore discloses a propane vapor delivery system. Ex.1011, [0013]. As shown in FIG. 1, the propane vapor delivery system includes a first pressure regulator (e.g., Reg. 1) and a second pressure regulator (e.g., Reg. 2). Ex.1011, FIG. 1

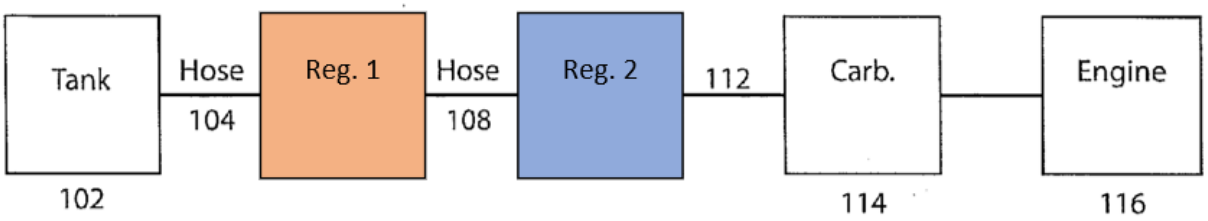


Fig. 1

Ex.1011, FIG. 1 (Emphasis Added).

[0392]. As shown in FIG. 3, the "LPG tank 300 may be located separate, but coupled to, an engine 310." Ex.1011, FIG. 3.

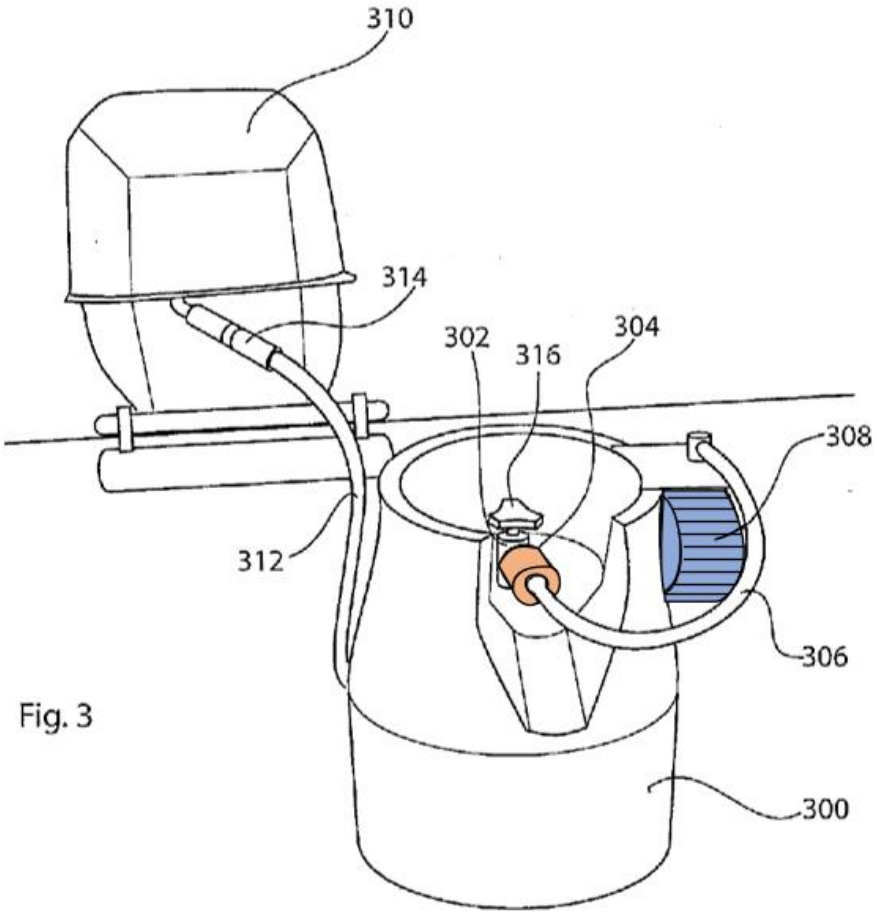


Fig. 3

Ex.1011, FIG. 3 (Emphasis Added).

[0393]. FIG. 3 of Parlatore discloses the primary and secondary regulator regulator mounted to a regulator mounting device. Ex.1011, FIG. 3. A POSA would understand that Parlatore discloses a fuel regulator system mounted to a LPG fuel source located off-board the internal combustion engine.

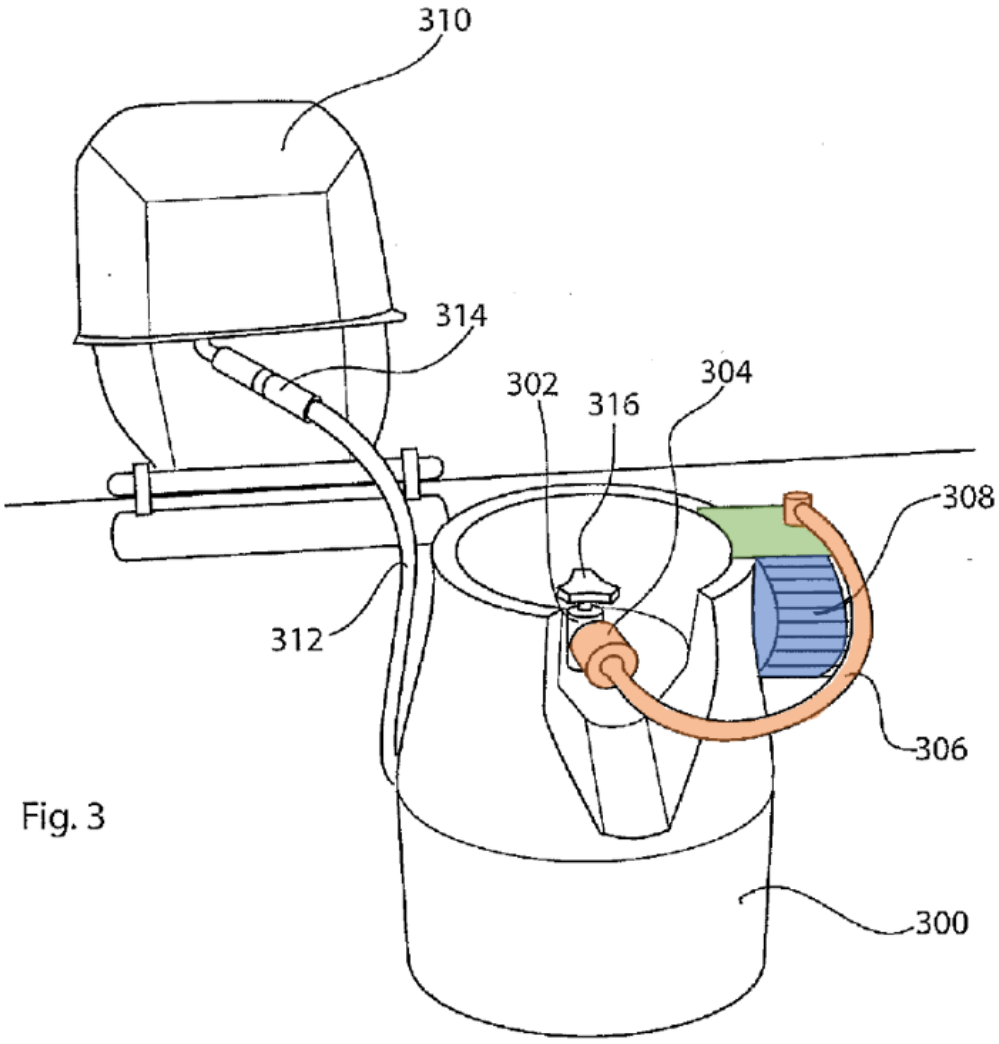


Fig. 3

Ex.1011, FIG. 3 (Emphasis Added).

[0394]. Accordingly, a POSA would understand that the combination of Rumao, DuroMax, Elsdon, and Parlatore, or alternatively, Rumao, Hallberg, and Parlatore, teaches claim 12.

2. Claim 13: "The method of claim 11, further comprising: coupling one end of a quick-disconnect hose coupling to an inlet on the internal combustion engine for the second fuel source; and coupling a mating end of the quick-disconnect hose coupling to an outlet of the fuel regulator system."

[0395]. The combination of Rumao, DuroMax, Elsdon, and Parlatore, or alternatively, Rumao, Hallberg, and Parlatore, teaches claim 13.

[0396]. Rumao discloses a method of assembling generators that includes "an engine configured to operate on a gaseous fuel source and…all related appurtenances and accessories necessary for a fully functional generator system (e.g., … pressure regulators)." Ex.1007, 29:20-33.

[0397]. Parlatore discloses hose 104 coupling an LPG supply to a first pressure regulator (e.g., Reg. 1). Ex.1011, FIG. 1. The first pressure regulator is coupled to the second pressure regulator (e.g., Reg. 2) via hose 108. *Id.* The second pressure regulator is coupled to the carburetor via hose 112. *Id.*

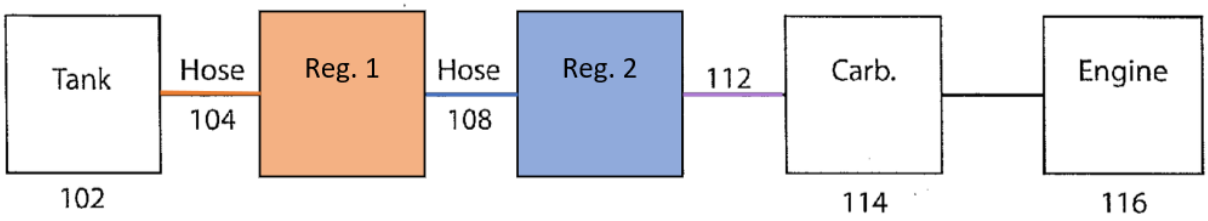


Fig. 1

Ex.1011, FIG. 1 (Emphasis Added).

[0398]. As shown in FIG. 3 (see below), in one embodiment, the LPG tank (e.g., LPG tank 300) may be coupled to the primary regulator 304 via connector 302. Ex.1011, [0020] and FIG. 3. Primary regulator 304 is also coupled

to secondary pressure regulator 308 via hose 306. *Id.* Secondary pressure regulator 308 is coupled to carburetor 114 via hose 312. *Id.*

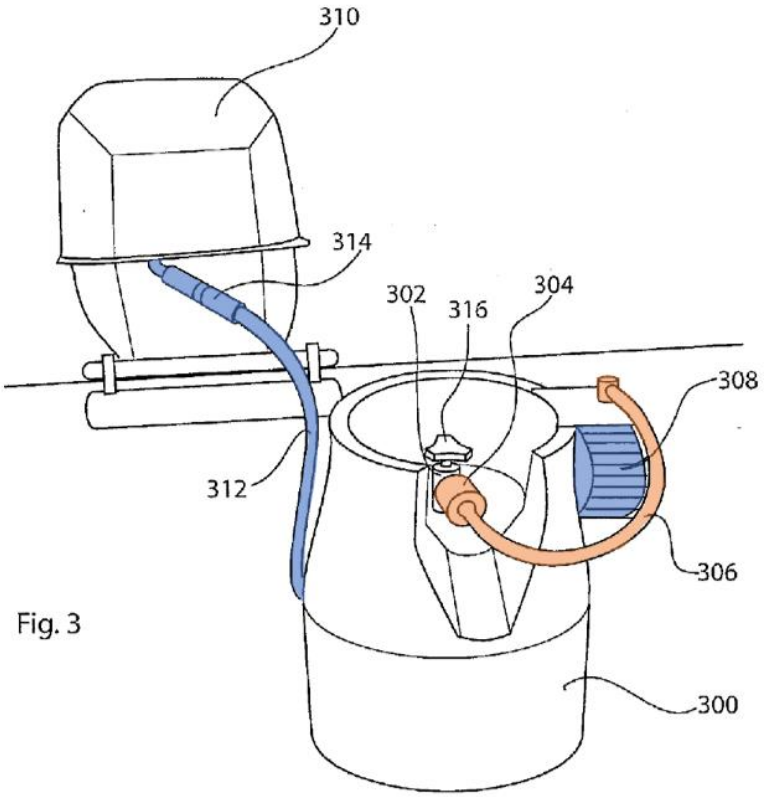


Fig. 3

Ex.1011, FIG. 3 (Emphasis Added).

[0399]. A low pressure output of secondary regulator 308 may be releasably attached to the propane carburetor. Ex.1011, [0020] and FIG. 3.

[0400]. A POSA would understand that a quick disconnect attachment could be attached to the LPG supply hose to releasably attach and disconnect the LPG supply hose to and from an inlet of the internal combustion engine. A quick-disconnect hose attachment is well known in the art as an attachment that allows a hose to be releasably coupled.

[0401]. A POSA would also understand that primary regulator 304 and secondary regulator 308 form a fuel regulator system, with secondary regulator 308 having an outlet connected to an internal combustion engine. A POSA would therefore have understood that Parlatore discloses a quick disconnect hose that can be coupled to an inlet on the internal combustion engine on one end, and coupled to an outlet of the fuel regulator system on the opposite end.

[0402]. Accordingly, a POSA, would understand that the combination of Rumao, DuroMax, Elsdon, and Parlatore, or alternatively, Rumao, Hallberg, and Parlatore teaches claim 13.

E. Ground 5: The Combination of DuroMax, Elsdon, and Parlatore Renders Obvious Claim 5.

[0403]. As discussed in §VII.A.1, *supra*, claim 1 is rendered obvious by the combination of DuroMax and Elsdon. Claim 3 depends from claim 1 and is also rendered obvious by the combination of DuroMax and Elsdon. *Supra*, §VII.A.3. Claim 5 depends from claim 3.

[0404]. A POSA would have looked to Parlatore to teach, and render obvious, any limitation not disclosed by the combination of DuroMax and Elsdon.

1. Claim 5: "The mechanical fuel lockout switch for a dual fuel engine of claim 3, further comprising; a first end of a quick-disconnect hose coupling attached to the inlet of the second fuel line; and a second end of the quick-disconnect hose coupling attached to the second fuel source to mate with the

first end of the quick-disconnect hose coupling to couple the second fuel source to the second fuel line."

[0405]. FIG. 3 of Parlatore discloses an LPG tank 102 coupled to an engine 310 via: primary regulator 304, hose 306, secondary pressure regulator 308, hose 312, and coupling 314. Ex.1011, [0020]-[0021], and FIG. 3.

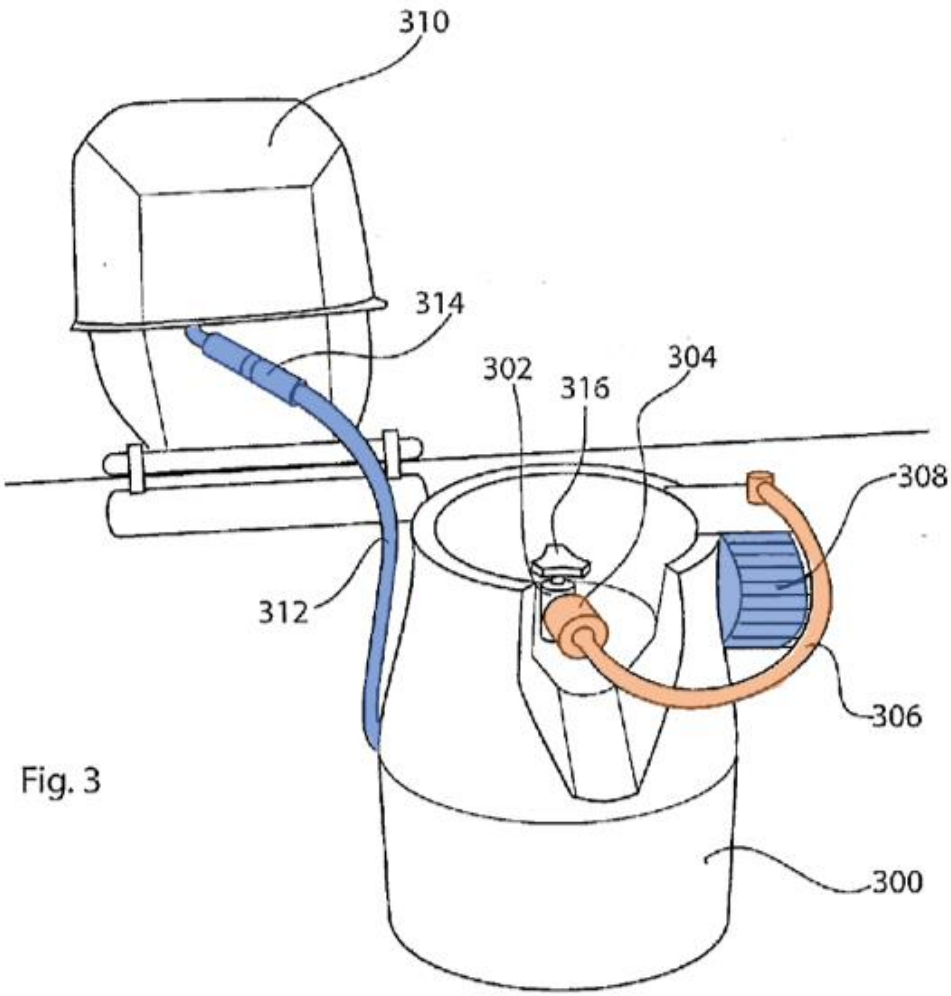


Fig. 3

Ex.1011, FIG. 3 (Emphasis Added).

[0406]. Parlatore also discloses that a low pressure output of secondary regulator 308 can be releasably attached to a propane carburetor. Ex.1011, [0020].

The low pressure output can be attached to the propane carburetor through hose 312 and coupling 314. *Id.*

[0407]. A POSA would have understood that coupling 314 and hose 312 can be a first end of a quick disconnect hose coupling attached to an inlet of the second fuel line of the engine 310.

[0408]. A POSA would also have understood that a second end of the quick disconnect hose coupling could be attached to an LPG supply tank to couple the LPG supply tank to the second fuel line.

[0409]. A POSA would therefore have understood that the combination of DuroMax, Elsdon and Parlatore teaches claim 5.

F. Ground 6: The Combination of Rumao, DuroMax, and Elsdon Renders Obvious Claim 10.

[0410]. As discussed in §VII.C.1, *supra*, claim 8 is anticipated and/or rendered obvious by the combination of Rumao, DuroMax and Elsdon. Claim 10 depends from claim 8.

1. Claim 10: "The method of claim 8, wherein the fuel lockout apparatus comprises a fuel inlet cover configured to actuate in unison with the mechanical fuel valve to cover a fuel inlet on the internal combustion engine for the second fuel source when the mechanical fuel valve is in the first position and uncover the fuel inlet when the mechanical fuel valve is in the second position."

[0411]. The combination of Rumao, DuroMax and Elsdon teaches claim 10. DuroMax discloses a mechanical fuel valve. *Supra*, §VII.A.1.b. Elsdon discloses a fuel lockout apparatus comprising a cap and shield. *Supra,* §VII.A.1.c.

[0412]. A POSA would have understood that the fuel lockout apparatus of Elsdon can be coupled to the mechanical fuel valve of DuroMax and configured to prevent the second fuel source from coupling to the second fuel line while the mechanical fuel valve is in the first position and permit the second fuel source to couple to the second fuel line while the mechanical fuel valve is in the second position. *Supra*, §§VII.A.1.c-e.

[0413]. A POSA would have also understood that when the cap is closed, the fluid conduit is covered. *Supra,* §VII.A.2. As described in §VII.A.1.e, *supra*, a POSA would have understood that operation of the mechanical fuel valve and the fuel lockout apparatus is interconnected such that only one fuel can be communicated to the engine at one time.

[0414]. It would thus have been obvious to a POSA that the fuel inlet cover actuate in unison with the mechanical fuel valve to cover a fuel inlet on the internal combustion engine for the second fuel source when the mechanical fuel valve is in the first position, and uncover the fuel inlet when the mechanical fuel valve is in the second position.

VIII. CONCLUSION

[0415]. In signing this Declaration, I recognize that the Declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross-examination in this proceeding. If required, I will appear for cross-examination at the appropriate time. I reserve the right to offer opinions relevant to the invalidity of the challenged claims and/or offer testimony in support of this Declaration.

[0416]. I hereby declare that all statements made herein of my own knowledge are true and that all statements are made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. § 1001.

EXHIBIT 1001

US010221780B2

(12) **United States Patent**
Sarder et al.

(10) **Patent No.: US 10,221,780 B2**
(45) **Date of Patent: Mar. 5, 2019**

(54) **DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE**

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(73) Assignee: **Champion Power Equipment, Inc.**, Santa Fe Springs, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 605 days.

(21) Appl. No.: **14/738,060**

(22) Filed: **Jun. 12, 2015**

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(51) **Int. Cl.**
F02D 19/06 (2006.01)

(52) **U.S. Cl.**
CPC ***F02D 19/0613*** (2013.01); ***F02D 19/0605*** (2013.01); ***F02D 19/0647*** (2013.01); ***F02D 19/0673*** (2013.01); *Y02T 10/36* (2013.01)

(58) **Field of Classification Search**
CPC F02D 19/0613; F02D 16/0605; F02D 19/0647; Y02T 10/36
See application file for complete search history.

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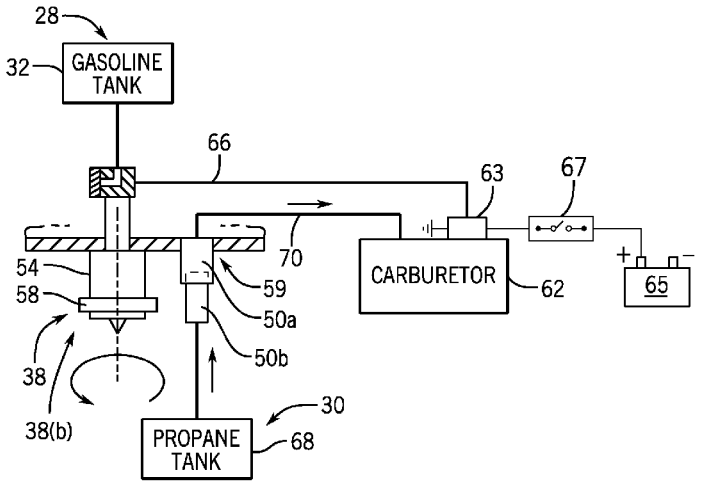
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Primary Examiner — Kevin A Lathers
(74) *Attorney, Agent, or Firm* — Ziolkowski Patent Solutions Group, SC

(57) **ABSTRACT**

A mechanical fuel lockout switch for a dual fuel engine includes a mechanical fuel valve actuateable between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line. The mechanical fuel lockout switch also includes a fuel lockout apparatus coupled to the mechanical fuel valve. The mechanical fuel lockout switch communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position.

15 Claims, 5 Drawing Sheets



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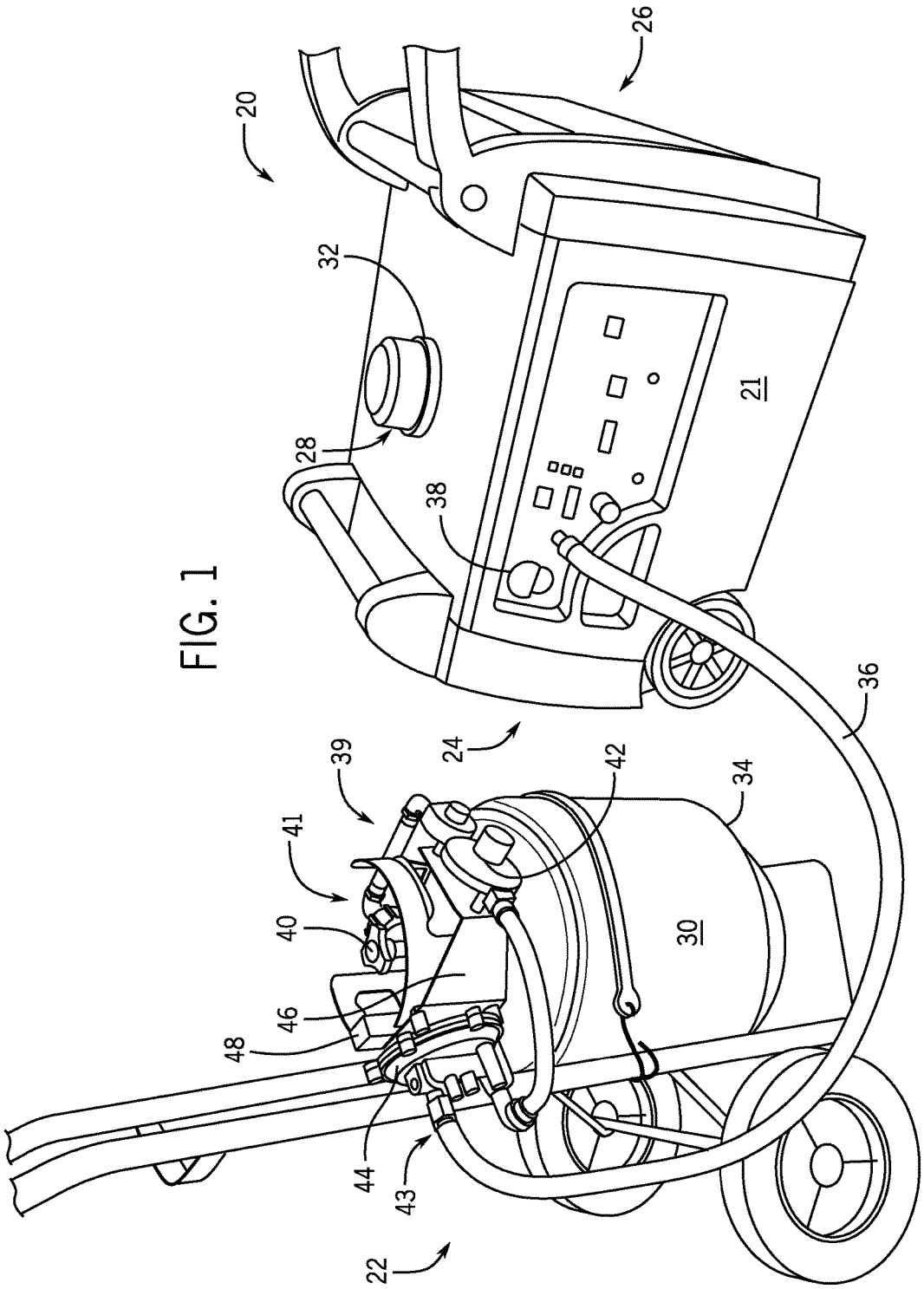


FIG. 1

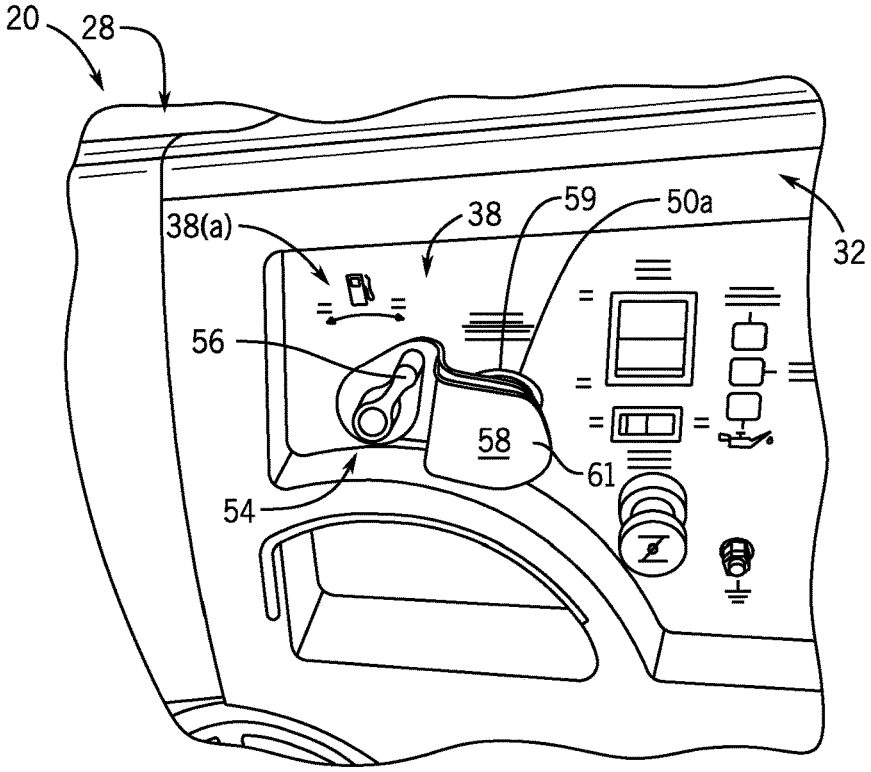

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38(a)
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50a
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FIG. 2

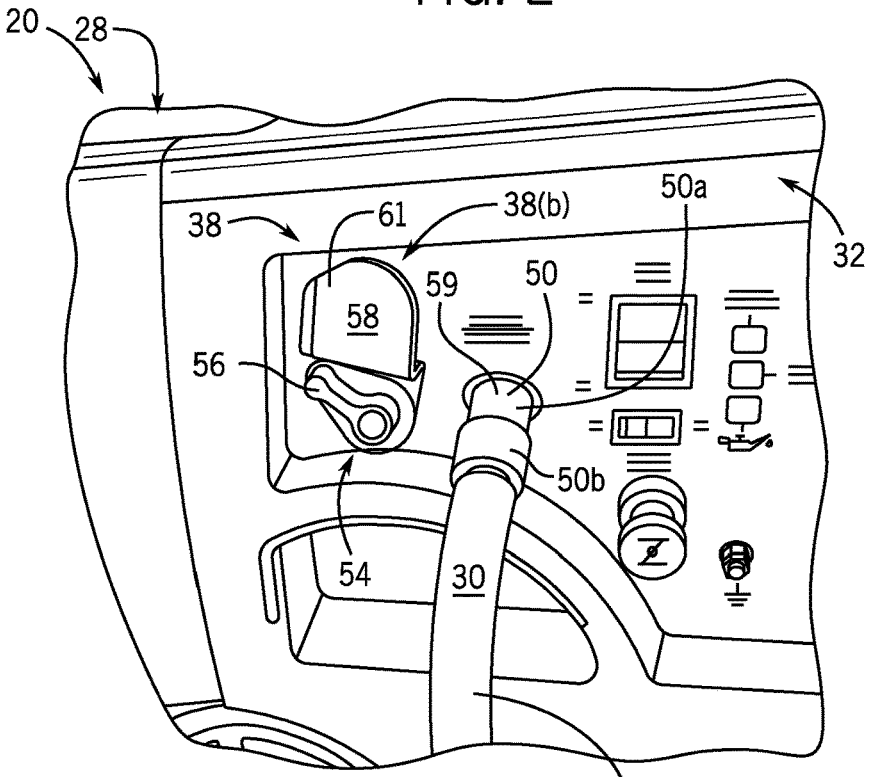

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FIG. 3

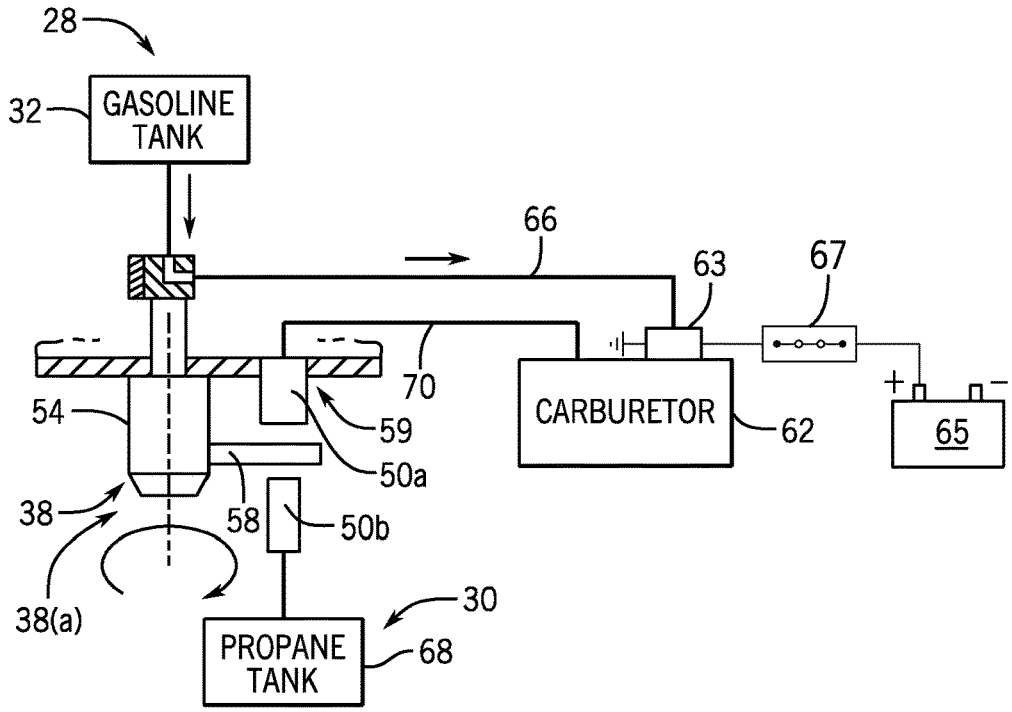

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GASOLINE TANK
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PROPANE TANK
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FIG. 4A

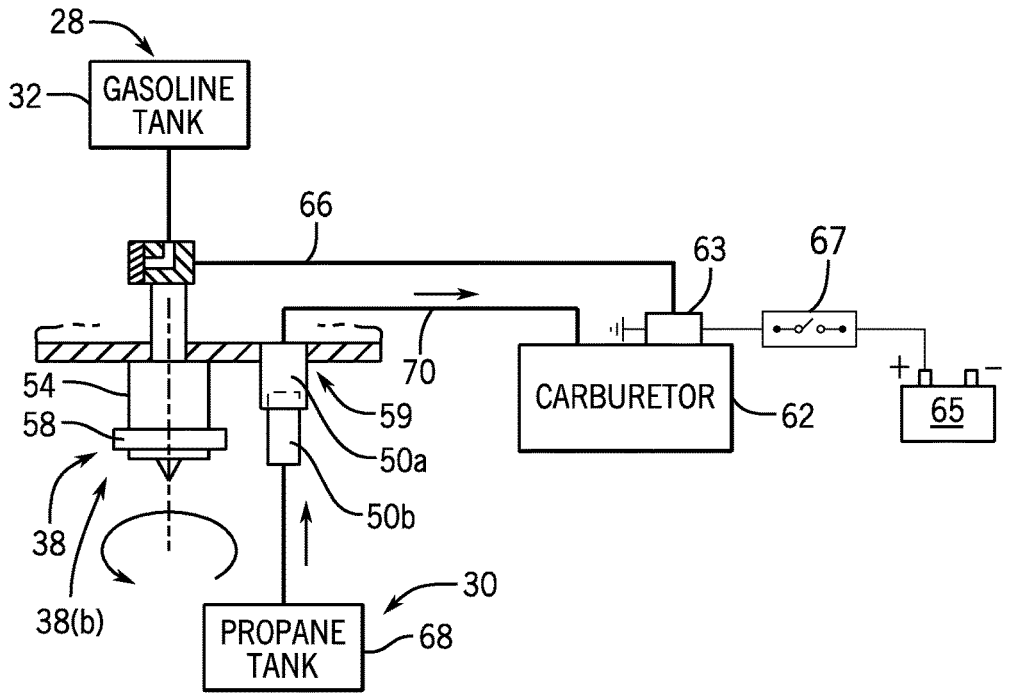

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38(b)
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PROPANE TANK
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FIG. 4B

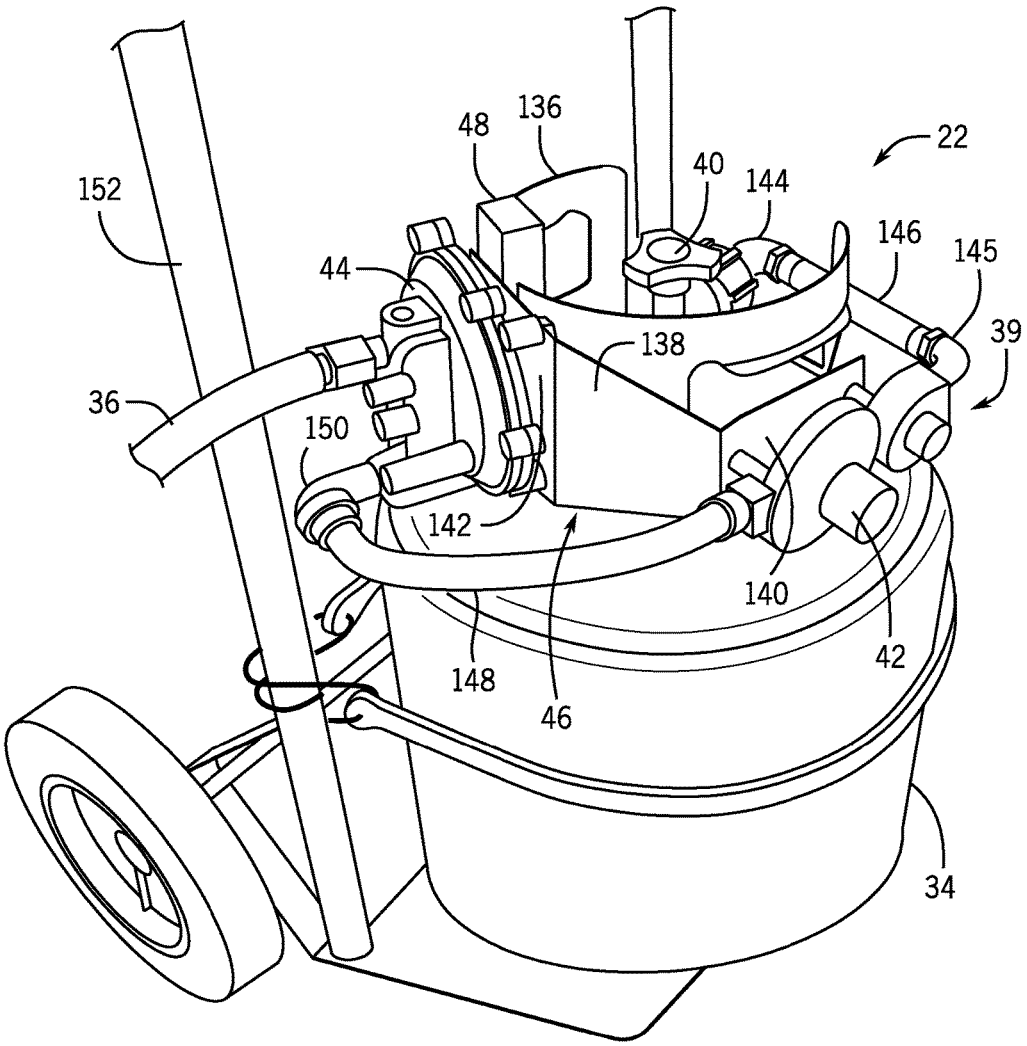


FIG. 5

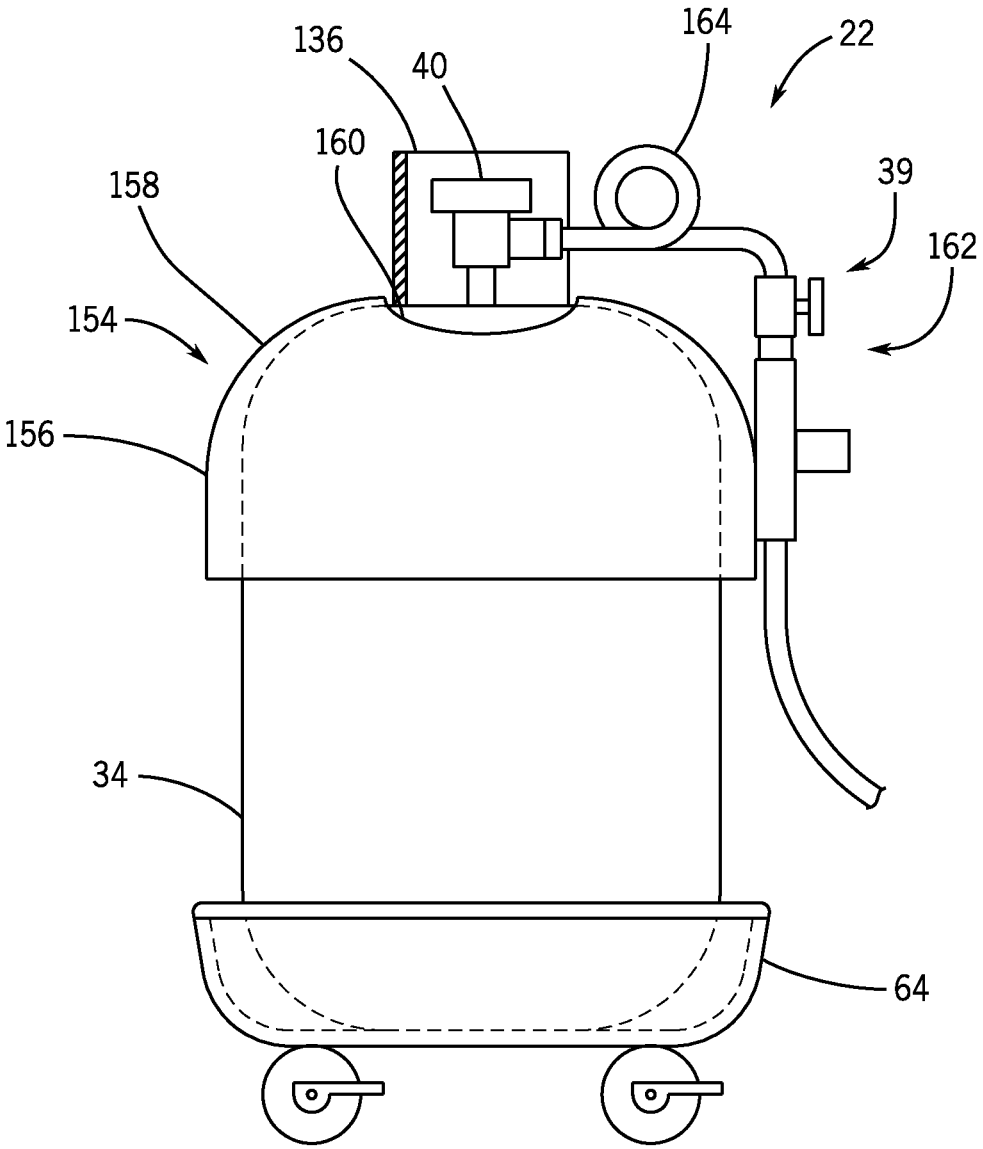


FIG. 6

DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE

BACKGROUND OF THE INVENTION

Embodiments of the invention relate generally to dual fuel generators, and more particularly, to an apparatus and method for delivering liquid fuel and gaseous fuel to a dual fuel generator.

Electric generators are frequently driven by internal combustion engines that use gasoline as a fuel source. Gasoline is a common fuel source for generators in a variety of applications. However, alternative fuel sources also provide a desirable fuel source. For instance, alternative fuels may provide a clean burning fuel that limits hazardous emissions. Alternative fuels may also be stored for long periods of time without degradation, whereas gasoline can degrade over a period of months leading to hard starting, rough running, and also lead to gum and varnish deposit left in the fuel system. In addition, generators that operate on alternative fuels may generate electricity when gasoline is not readily available. For instance, generators are frequently used when power outages in the utility grid result from severe weather. Unfortunately, gas stations may also be closed as a result of the power outage. Such a circumstance presents just one example where it would be advantageous to operate electrical generators on alternative fuels.

Certain generators are configured to operate as "dual fuel" generators, otherwise known as bi-fuel generators. These generators are driven by an internal combustion engine that is configured to operate on a liquid fuel for a period of operation and an alternative fuel for another period of operation. The alternative fuel source may exist in a gaseous state at normal temperature and pressure and can be any one of liquefied petroleum gas, compressed natural gas, hydrogen, or the like. Liquefied petroleum gas (LPG), often referred to as propane, exists in a gaseous state at normal temperature and pressure but can be conveniently stored under pressure in a liquid state. LPG may be a desirable fuel source for internal combustion engines because it can be stored for longer periods of time and contains fewer impurities than gasoline, resulting in smoother and cleaner operation, and often resulting in a longer lasting engine.

In order to provide the liquid and gaseous fuel to the engine, the dual fuel engine may have a first fuel line for liquid fuel and a second fuel line for gaseous fuel. A liquid fuel source and a gaseous fuel source may be coupled to the respective lines to provide fuel to the engine. However, a common problem with such configurations that couple two fuel sources to a single engine is the engine can experience overly rich air-fuel ratio when both fuels are simultaneously engaged during cross-over switching between the fuel sources. Further, such simultaneous delivery of fuel from the first fuel line and the second fuel line may make the engine hard to start or lead to unstable operating conditions.

Therefore, it would be desirable to design a dual fuel generator having a liquid fuel and gaseous fuel delivery system that overcomes the aforementioned detriments without substantially increasing the overall cost of the system.

BRIEF DESCRIPTION OF THE INVENTION

In accordance with one aspect of the invention, a mechanical fuel lockout switch for a dual fuel engine provides for the selection of a desired fuel to operate the engine. The mechanical fuel lockout switch includes a mechanical fuel valve and a fuel lockout apparatus. The mechanical fuel valve actuates between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line. The fuel lockout apparatus couples to the mechanical fuel valve ensuring individual communication of the fuel sources to the engine. The mechanical fuel lockout switch communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position.

In accordance with another aspect of the invention, a dual fuel generator and fuel delivery system includes 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 and fuel delivery system also includes a fuel regulator system located off board the dual fuel generator to control the pressure of fuel from the pressurized fuel source and deliver the fuel at a desired pressure for operation of the generator. The fuel regulator system includes 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. The fuel regulator system also includes 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. The dual fuel generator and fuel delivery system further includes a mechanical fuel valve actuateable 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.

In accordance with yet another aspect of the invention, a method of assembling a mechanical fuel lockout switch for an internal combustion engine includes providing an internal combustion engine configured to operate on a fuel from a first fuel source and a different fuel from a second fuel source. The method also includes coupling a mechanical fuel valve to the internal combustion engine actuateable between a first position and a second position to selectively control fuel flow to the internal combustion engine from the first fuel source through a first fuel line and the second fuel source through a second fuel line. The method further includes coupling a fuel lockout apparatus to the mechanical fuel valve. When the mechanical fuel valve is in the first position, the fuel lockout apparatus communicates the first fuel source to the internal combustion engine and prevents the second fuel source from coupling to the internal combustion engine, and actuation of the mechanical fuel valve to the second position causes the fuel lockout apparatus to permit the second fuel source to couple to the internal combustion engine, and interrupts the first fuel source communication with the internal combustion engine.

Various other features and advantages will be made apparent from the following detailed description and the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

The drawings illustrate preferred embodiments presently contemplated for carrying out the invention.

In the drawings:

FIG. **1** is a perspective view of a dual fuel generator coupled to a fuel delivery system, according to an embodiment of the invention.

FIG. **2** is a detail view of a portion of the generator of FIG. **1** about a mechanical fuel lockout switch with the switch in a first position, according to an embodiment of the invention.

FIG. **3** is a detail view similar to FIG. **2** and showing the mechanical fuel lockout switch in a second position, with an LPG supply line connected thereto, according to an embodiment of the invention.

FIG. **4**A is a schematic diagram of a fuel system for the dual fuel generator of FIG. **1** showing a liquid fuel source in communication with a carburetor of the generator consistent with the first position of the switch as shown in FIG. **2**, according to an embodiment of the invention.

FIG. **4**B is a schematic diagram of the fuel system of FIG. **4**A showing a gaseous fuel source in communication with a carburetor of the generator of FIG. **1** consistent with the second position of the switch as shown in FIG. **3**, according to an embodiment of the invention.

FIG. **5** is a perspective view of a fuel delivery system for the dual fuel generator of FIG. **1**, according to an embodiment of the invention.

FIG. **6** is a side view of a fuel delivery system for the dual fuel generator of FIG. **1**, according to an embodiment of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The operating environment of the invention is described with respect to a dual fuel generator. However, it will be appreciated by those skilled in the art that the invention is equally applicable for use with any dual fuel internal combustion engine. Moreover, the invention will be described with respect to a dual fuel generator configured to operate on a liquid fuel and a gaseous fuel. However, one skilled in the art will further appreciate that the invention is equally applicable for use with other fuel combinations for dual fuel generators and internal combustion engines.

Referring to FIG. **1**, a dual fuel generator **20** is coupled to a fuel delivery system **22**, in accordance with an embodiment of the invention. Dual fuel generator **20** includes an internal combustion engine (not shown) within housing **21** at one end **24**, operatively connected to an alternator also enclosed in housing **21** at another end **26**, by conventional means. Dual fuel generator **20** is configured to operate on different fuels via either a first fuel source **28** or a second fuel source **30**. In an exemplary embodiment of the invention, first fuel source **28** is a liquid fuel and second fuel source **30** is a gaseous fuel. The liquid fuel may be gasoline and the gaseous fuel may be liquid petroleum gas (LPG). Each can selectively operate the generator as desired and controlled by an operator. For instance, generator **20** may operate on gasoline for a first period of operation and then switch to LPG for a second period of operation. However, it is contemplated that dual fuel generator **20** is configured to operate on fuels other than gasoline and LPG (e.g., natural gas, biodiesel, etc.), and thus the scope of the invention is not meant to be limited strictly to a dual fuel arrangement where first fuel source **28** provides gasoline and second fuel source **30** provides LPG.

In one embodiment of the invention, dual fuel generator **20** includes a gasoline tank **32** or, generally, a liquid fuel tank, located inside cover **21** onboard generator **20** to provide gasoline to the engine as first fuel source **28**. Gasoline tank **32** connects to a first fuel line to provide gasoline to the carburetor to run the engine, as will later be described with reference to FIGS. **4**A and **4**B. Generator **20** is also coupled to a pressurized fuel container **34**, or a pressurized fuel source, located off board generator **20** to provide LPG to the engine as second fuel source **30**. Pressurized fuel container **34** is coupled to generator **20** with an LPG supply hose **36**. LPG supply hose **36** is coupled to a second fuel line within generator **20** to provide LPG to the carburetor to run the engine. Dual fuel generator **20** includes a mechanical fuel lockout switch **38** for selecting a desired fuel to be provided to the engine. The mechanical fuel lockout switch **38** is actuated to select first fuel source **28** when in a first position, as shown in FIG. **2**, and alternately to select second fuel source **30** when in a second position, as shown in FIG. **3**.

Referring back to FIG. **1**, in an exemplary embodiment, fuel **30** from pressurized fuel container **34** is regulated using a fuel regulator system **39** for delivery to the engine. Fuel regulator system **39** includes one or more pressure regulators that reduce and control the pressure of the fuel from pressurized fuel container **34** and delivers fuel at a desired pressure for operation of the engine. Fuel regulator system **39** has an inlet **41** operatively coupled to a service valve **40** of pressurized fuel container **34** and an outlet **43** coupled to LPG supply hose **36**. Fuel regulator system **39** includes a primary pressure regulator **42** coupled to pressurized fuel container **34** and a secondary pressure regulator **44**. Primary pressure regulator **42** protects downstream components from high pressure of pressurized fuel container **34**. Primary pressure regulator **42** receives LPG through service valve **40** of pressurized fuel container **34** and reduces the pressure of the LPG to a first stage. In one embodiment of the invention, the first stage may be delivered directly to generator **20** at a pressure required for operation of the engine.

In an exemplary embodiment of the invention, fuel regulator system **39** includes secondary pressure regulator **44** coupled to the outlet of primary pressure regulator **42** in order to use standard "off-the-shelf" components. Typically, the primary pressure regulator is mounted on the LPG tank, while the secondary pressure regulator is mounted on the component using the fuel, such as an engine or grill. Here, since generator **20** can be used as a gasoline only generator, secondary pressure regulator **44** is mounted off-board the generator to reduce size and cost of the generator. Secondary pressure regulator **44** receives LPG from primary pressure regulator **42** and further reduces the pressure of LPG to a second stage to be delivered to generator **20**. In a system with two regulators, primary pressure regulator **42** regulates fuel received from pressurized fuel container **34** and reduces the pressure of the fuel to a level required for operation of secondary pressure regulator **44**. Secondary pressure regulator **44** regulates fuel received from primary pressure regulator **42** and further reduces the pressure of the fuel to a level required for operation of generator **20**. In addition, primary pressure regulator **42** may compensate for varying tank pressure as fuel is depleted while secondary pressure regulator **44** may compensate for varying demand from generator **20**.

In accordance with an exemplary embodiment of the invention, fuel regulator system **39** includes both the primary and secondary regulators, or a custom single regulator, but in any case is located remotely, or off-board, from dual fuel generator **20**. Fuel regulator system **39** may be directly mounted to pressurized fuel container **34** using a regulator mounting bracket **46**. Regulator mounting bracket **46** has

mounting locations for primary pressure regulator **42** and secondary pressure regulator **44**. Regulator mounting bracket **46** also has a securing mechanism **48** to secure regulator mounting bracket **46** to pressurized fuel container **34**.

In another embodiment of the invention, primary pressure regulator **42** is mounted on regulator mounting bracket **46** while secondary pressure regulator **44** could be mounted on or near generator **20**. In yet another embodiment of the invention, a dual stage regulator may regulate the fuel received from pressurized fuel container **34** and deliver fuel at a pressure required for operation of generator **20**. Such a dual stage regulator may regulate the fuel to the second stage within a single structure. The dual stage regulator may be mounted directly on fuel container **34**.

Referring to FIG. **2**, a detail view of a portion of generator **20** of FIG. **1** depicts mechanical fuel lockout switch **38** in a first position **38**(*a*), in accordance with an embodiment of the invention. In this position, mechanical fuel lockout switch **38** provides gasoline flow from gasoline tank **32** to the engine while preventing connection of an LPG supply line to fuel inlet **59** of the second fuel line, as will later be discussed in detail with reference to FIGS. **4**A and **4**B. Still referring to FIG. **2**, mechanical fuel lockout switch **38** provides a combination liquid fuel shutoff valve and a gaseous fuel supply lockout that prevents simultaneous delivery of fuel to the engine from gasoline tank **32** and pressurized fuel container **34**, FIG. **1**. As such, mechanical fuel lockout switch **38** provides a fuel selector to ensure only the selected fuel is provided to dual fuel generator **20**.

Mechanical fuel lockout switch **38**, FIG. **2**, includes mechanical fuel valve **54** actuateable between first position **38**(*a*) as shown in FIG. **2** and second position **38**(*b*) as shown in FIG. **3** to selectively control fuel flow to the dual fuel engine from first fuel source **28** through a first fuel line and second fuel source **30** through a second fuel line **36**. Mechanical fuel lockout switch **38** may also include fuel lockout apparatus **58** coupled to mechanical fuel valve **54** to communicate fuel sources individually to generator **20**. In one embodiment of the invention, fuel lockout apparatus **58** communicates first fuel source **28** to the engine by actuating mechanical fuel valve **54** to first position **38**(*a*) to open the first fuel line as shown in FIG. **2**, and communicates second fuel source **30** to the engine by actuating mechanical fuel valve **54** to second position **38**(*b*) to open communication of the second fuel source **30** to the engine as shown in FIG. **3**. Referring back to FIG. **2**, when mechanical fuel valve **54** is in first position **38**(*a*), fuel lockout apparatus **58** communicates first fuel source **28** to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine.

In an exemplary embodiment of the invention, mechanical fuel valve **54** controls the flow of LPG to the engine by actuating fuel lockout apparatus **58** to block or unblock fuel inlet **59** for the second fuel source. Mechanical fuel valve **54** is coupled to the first fuel line, as shown in FIGS. **4**A and **4**B, and therefore can control the flow of gasoline to the engine by opening and closing the first fuel line. When the mechanical fuel valve **54**, FIG. **2**, is in the first position **38**(*a*), gasoline flows from the gasoline tank to the engine and the fuel lockout apparatus **58** blocks the fuel inlet **59**. Accordingly, fuel lockout apparatus **58** prevents LPG flow to generator **20** when the mechanical fuel valve **54** is in first position **38**(*a*) wherein the engine is operated on gasoline.

Mechanical fuel valve **54** includes a fuel valve handle **56** to control the opening and closing of the valve. Fuel valve handle **56** is movable between first position **38**(*a*) as shown in FIG. **2** and second position **38**(*b*) as shown in FIG. **3**. Mechanical fuel valve **54** opens the first fuel line (to enable liquid fuel flow to the engine) when fuel valve handle **56** is in the first position, and mechanical fuel valve **54** closes the first fuel line (to prevent liquid fuel flow to the engine) when fuel valve handle **56** is in the second position. Thus, when fuel valve handle **56** is in first position **38**(*a*) as shown in FIG. **2**, mechanical fuel valve **54** opens the first fuel line and allows gasoline from gasoline tank **32** to flow to the engine.

Fuel valve handle **56** is coupled to fuel lockout apparatus **58**. Fuel valve handle **56** actuates with fuel lockout apparatus **58** to prevent LPG flow to generator **20** when gasoline flow to the generator is enabled. Fuel lockout apparatus **58** is controlled by fuel valve handle **56** so that moving fuel valve handle **56** to the first position causes fuel lockout apparatus **58** to block fuel inlet **59** for LPG, and moving fuel valve handle **56** to the second position causes fuel lockout apparatus **58** to unblock fuel inlet **59** for LPG.

In an exemplary embodiment of the invention, fuel valve handle **56** rotates between the first position and the second position and fuel lockout apparatus **58** is rigidly coupled to the rotating handle. Fuel lockout apparatus **58** may include a fuel inlet cover **61**, which may be a flange, coupled to fuel valve handle **56** so that fuel inlet cover **61** rotates with the handle. Fuel inlet cover **61** extends radially outward from fuel valve handle **56** and sweeps over fuel inlet **59** for LPG as fuel valve handle **56** rotates. That is, fuel inlet cover **61** rotates transversely across fuel inlet **59** and blocks access thereto. Accordingly, fuel inlet cover **61** prevents LPG flow to generator **20** when fuel valve handle **56** is in first position **38**(*a*) to allow gasoline to run the engine.

Referring to FIG. **3**, a detail view of a portion of generator **20** of FIG. **1** depicts mechanical fuel lockout switch **38** in a second position **38**(*b*), in accordance with an embodiment of the invention. In this position, the mechanical fuel lockout switch **38** provides a disconnect to stop gasoline flow from gasoline tank **32** to the engine while allowing connection of LPG supply hose **36** to fuel inlet **59** of the second fuel line. FIG. **3** further shows LPG supply hose **36** coupling second fuel source **30** to generator **20** to deliver LPG to run the generator.

Mechanical fuel lockout switch **38** includes mechanical fuel valve **54** coupled to fuel lockout apparatus **58** to prevent gasoline flow to generator **20** when LPG from the LPG service hose **36** is supplied to the engine. In one embodiment of the invention, actuation of mechanical fuel valve **54** to second position **38**(*b*) causes fuel lockout apparatus **58** to allow communication of second fuel source **30** to the dual fuel engine, and interrupts the first fuel source **28** communication with the dual fuel engine. The position of fuel lockout apparatus **58** prevents the fuel valve handle **56** from moving to first position **38**(*a*) (FIG. **2**) while LPG supply hose **36** is connected to generator **20**.

A quick-disconnect hose coupling **50**, also referred to as a quick-connect hose coupling, connects LPG supply hose **36** to generator **20** so that LPG supply hose **36** may be quickly attached and detached from generator **20**. Hose coupling **50** has a first end **50***a* mounted on the external surface of generator **20** and coupled to supply the second fuel to the engine. Hose coupling **50** has a second end **50***b* coupled to the outlet of LPG supply hose **36**. Hose coupling **50** has a valve that opens when the couplings are engaged and closes when the couplings are disengaged. As such, quick-disconnect hose coupling **50** automatically opens when connected to enable fuel flow from LPG supply hose **36** to the engine. Hose coupling **50** automatically disconnects fluid communication when disconnected. Accordingly,

when the supply hose is detached from generator **20**, the coupling **50** is automatically closed so that fuel does not escape and unwanted air does not enter the fuel system.

In one embodiment, fuel inlet cover **61** is coupled to fuel valve handle **56** so that it is spaced apart from the surface of generator **20** to provide clearance for first end **50***a* of the quick-disconnect hose coupling **50** that protrudes from the surface of generator **20**. As shown in FIG. **2**, fuel inlet cover **61** blocks off first end **50***a* of the quick-disconnect hose coupling when fuel valve handle **56** is rotated to first position **38**(*a*) to enable gasoline flow so that fuel inlet cover **61** prevents connection of LPG supply hose **36** (FIG. **3**) to generator **20**. As shown in FIG. **3**, fuel inlet cover **61** uncovers first end **50***a* of the quick-disconnect hose coupling **50** when fuel valve handle **56** is rotated to second position **38**(*b*) to disable gasoline flow so that fuel inlet cover **61** permits connection of LPG supply hose **36** to generator **20**.

To operate generator **20** on LPG, fuel valve handle **56** is turned to second position **38**(*b*) to disable the flow of gasoline to the engine and to expose first end **50***a* of hose coupling **50** on generator **20**. LPG supply hose **36** is then connected to generator **20** via hose coupling **50** to enable the flow of LPG to the engine. To operate generator **20** on gasoline, LPG supply hose **36** is disconnected from generator **20** via hose coupling **50** to disable the flow of LPG to the engine and to unblock fuel valve handle **56** from rotating to the first position. As shown in FIG. **2**, fuel valve handle **56** is then turned to first position **38**(*a*) to enable the flow of gasoline to generator **20**.

Referring to FIG. **4**A, a schematic diagram of a fuel system for a dual fuel engine shows mechanical fuel lockout switch **38** in first position **38**(*a*) to provide communication between the first fuel source **28** and dual fuel carburetor **62**, according to an embodiment of the invention. Mechanical fuel lockout switch **38** prevents communication between second fuel source **30** and dual fuel carburetor **62** when the switch is in first position **38**(*a*). In one embodiment of the invention, first fuel source **28** includes a gasoline tank **32** to provide gasoline to carburetor **62** through a first fuel line **66**, and second fuel source **30** includes a propane or LPG tank **68** to provide propane or LPG to carburetor **62** through a second fuel line **70**. Accordingly, first fuel line **66** may be a liquid fuel line and second fuel line **70** may be a gaseous fuel line.

Mechanical fuel lockout switch **38** includes a mechanical fuel valve **54** actuateable between first position **38**(*a*) as shown in FIG. **4**A and second position **38**(*b*) as shown in FIG. **4**B to selectively control fuel flow to the dual fuel engine from first fuel source **28** through first fuel line **66** and second fuel source **30** through second fuel line **70**. Referring back to FIG. **4**A, mechanical fuel valve **54** selectively controls fuel flow through first fuel line **66** by opening the line when the mechanical fuel lockout switch **38** actuates to first position **38**(*a*). Mechanical fuel valve **54** may be coupled to fuel lockout apparatus **58** that actuates with mechanical fuel valve **54** to block and unblock fuel inlet **59** of second fuel line **70**. First end **50***a* of the quick-disconnect hose coupling is located at fuel inlet **59** and a mating end **50***b* of the quick-disconnect hose coupling is coupled to the propane or LPG tank **68**. Actuation of mechanical fuel valve **54** to first position **38**(*a*) causes fuel lockout apparatus **58** to block fuel inlet **59** to prevent coupling the first end **50***a* and second end **50***b* of the quick-disconnect hose coupling together, and actuation of mechanical fuel valve **54** to another position causes fuel lockout apparatus **58** to unblock fuel inlet **59** to permit attaching first end **50***a* and second end **50***b* together.

In one embodiment of the invention, a fuel cut solenoid **63** couples to carburetor **62** to regulate liquid fuel flow into a main nozzle within the carburetor. Fuel cut solenoid **63** is advantageous to control liquid fuel flow downstream of a float bowl in the carburetor and can stop fuel flow to the engine immediately after ignition shutdown. As such, fuel cut solenoid **63** prevents the engine from drawing in fuel from the float bowl while the engine shuts off. Fuel cut solenoid **63** also traps fuel in the float bowl to eliminate delay in filling the bowl when starting the engine on liquid fuel, and prevents liquid fuel flow from the float bowl to the engine when starting on gaseous fuel.

Fuel cut solenoid **63** may regulate fuel flow through multiple fuel lines in carburetor **62** that provide fuel from the float bowl to the engine. For instance, carburetor **62** may have a main fuel line and an idle fuel line that receive fuel from the float bowl. Fuel cut solenoid **63** may control fuel flow through all of the fuel lines that receive fuel from the float bowl or may regulate only some of the fuel lines. As such, fuel cut solenoid **63** may block fuel flow through the main fuel line while small amounts of fuel can flow through the idle fuel line.

Fuel cut solenoid **63** preferably operates as a normally closed valve that opens when powered by a 12 volt battery **65**, although fuel cut solenoid **63** may also be operated as a normally open valve. The normally closed valve is opened for gasoline mode to allow gasoline flow to the engine and closed for LPG mode to prevent gasoline flow to the engine. Fuel cut solenoid **63** is operated by an electrical switch **67** which may be mechanically actuated and controlled by mechanical fuel lockout switch **38**. As such, actuation of mechanical fuel lockout switch **38** to first position **38**(*a*) closes electrical switch **67** to power and open fuel cut solenoid **63** as represented in FIG. **4**A, and actuation of mechanical fuel lockout switch **38** to second position **38**(*b*) opens electrical switch **67** to interrupt power and close fuel cut solenoid **63** as represented in FIG. **4**B.

Referring to FIG. **4**B, a schematic diagram of a fuel system for a dual fuel engine shows mechanical fuel lockout switch **38** in second position **38**(*b*) to provide communication between second fuel source **30** and dual fuel carburetor **62**, according to an embodiment of the invention. Mechanical fuel lockout switch **38** prevents communication between first fuel source **28** and dual fuel carburetor **62** when the switch is in second position **38**(*b*). The dual fuel engine has a first fuel line **66** to provide fuel from first fuel source **28** to carburetor **62** and a second fuel line **70** to provide fuel from second fuel source **30** to carburetor **62**.

Mechanical fuel lockout switch **38** includes mechanical fuel valve **54** that selectively controls fuel flow through first fuel line **66** by closing the line when mechanical fuel lockout switch **38** actuates to second position **38**(*b*). Mechanical fuel lockout switch **38** may also include a mechanical lockout apparatus **58** to block and unblock fuel inlet **59** of the second fuel line **70**. Fuel inlet **59** may include first end **50***a* of the quick-connect hose coupling mounted on the generator and coupled to second fuel line **70**. Second end **50***b* of the quick-connect hose coupling is coupled to the outlet of second fuel source **30**, and the first end **50***a* mates with second end **50***b* to quickly attach propane or LPG tank **68** to second fuel line **70**. Fuel lockout apparatus **58** may also hold mechanical fuel lockout switch **38** in second position **38**(*b*) when the propane or LPG tank **68** is coupled to the engine via the ends **50***a*, **50***b* of the quick-connect hose coupling.

Fuel cut solenoid **63** couples to carburetor **62** to regulate liquid fuel flow through the carburetor as described with respect to FIG. **4**A. FIG. **4**B shows electrical switch **67**

opened to interrupt power and close fuel cut solenoid **63** for LPG mode when mechanical fuel lockout switch **38** is in second position **38**(*b*).

FIGS. **4**A and **4**B depict an embodiment where mechanical fuel valve **54** operates along first fuel line **66** to provide a flow path for first fuel source **28** to carburetor **62** when the valve is in first position **38**(*a*). That is, mechanical fuel valve **54** may control a single fuel line that runs through the valve while operating fuel lockout apparatus **58** to control fuel flow through second fuel line **70**. Embodiments of the invention also contemplate mechanical fuel valve **54** configured to operate along second fuel line **70** to provide a flow path for second fuel source **30** to carburetor **62** when the valve is in second position **38**(*b*). Mechanical fuel valve **54** may be configured to control multiple fuel lines that run through the valve according to embodiments of the invention.

Referring now to FIG. **5**, a perspective view of fuel delivery system **22** for dual fuel generator **20** of FIG. **1** is shown, in accordance with an embodiment of the invention. Fuel delivery system **22** includes a mounting arrangement for fuel regulator system **39**. The mounting arrangement includes regulator mounting bracket **46** for mounting fuel regulator system **39**. Regulator mounting bracket **46** extends around the outer periphery of collar **136** on pressurized fuel container **34**. Regulator mounting bracket **46** has securing mechanism **48** to secure to collar **136**. In one embodiment, securing mechanism **48** is a rigid component that extends inward from regulator mounting bracket **46** with a slot for receiving collar **136** to hold regulator mounting bracket **46** to collar **136**.

Regulator mounting bracket **46** provides mounting locations for pressure regulators. In one embodiment, regulator mounting bracket **46** is made of sheet metal bent in two locations to provide a central panel **138**, a first outer panel **140**, and a second outer panel **142** for mounting the regulators. The panels may be angled from each other such that regulator mounting bracket **46** fits around collar **136**. Primary pressure regulator **42** mounts on first outer panel **140** and secondary pressure regulator **44** mounts on second outer panel **142**. The panels are sized according to their respective regulators. Accordingly, second outer panel **142** is larger than first outer panel **140** if secondary pressure regulator **44** is larger than primary pressure regulator **42**. Panels **140**, **142** have fasteners or openings to receive fasteners to couple respective regulators **42**, **44** to the panels. Regulator mounting bracket **46** rests on top of pressurized fuel container **34** and engages the periphery of collar **136** to support fuel regulator system **39** on the container.

In one embodiment of the invention, primary pressure regulator **42** couples to two ninety degree elbows **144**, **145** to reach around collar **136** in order to couple to service valve **40**. The two elbows **144**, **145** are joined by a hose or pipe **146** that leads from elbow **144** at service valve **40** to elbow **145** at the outer periphery of collar **136**. The outlet of primary pressure regulator **42** couples to a hose **148** that extends to another ninety degree elbow **150** coupled to the inlet of secondary pressure regulator **44**. Secondary pressure regulator **44** couples to LPG supply hose **36**. Pressurized fuel container **34** may be strapped to a dolly **152**.

Referring now to FIG. **6**, a side view of another fuel delivery system **22** for dual fuel generator **20** of FIG. **1** is shown, in accordance with an embodiment of the invention. Fuel delivery system **22** includes a mounting arrangement for fuel regulator system **39**. The mounting arrangement includes a regulator mounting structure **154** for mounting fuel regulator system **39** to pressurized fuel container **34**. Regulator mounting structure **154** includes a cylinder **156** that surrounds the circumference of pressurized fuel container **34** to secure regulator mounting structure **154** radially along the circumference of pressurized fuel container **34**. Cylinder **156** couples to a dome **158** to support cylinder **156** relative to the top of pressurized fuel container **34**. Dome **158** has a central opening **160** through which collar **136** of pressurized fuel container **34** extends. Collar **136** of pressurized fuel container **34** extends through dome **158** so that service valve **40** is easily accessible from above regulator mounting structure **154** and so that dome **158** sits on pressurized fuel container **34** around collar **136**.

Regulator mounting structure **154** supports pressure regulators around the outer circumference of cylinder **156**. In some embodiments of the invention, a dual stage pressure regulator **162** functions as both a primary pressure regulator and a secondary pressure regulator in a single integral component, and dual stage pressure regulator **162** may be mounted on regulator mounting structure **154**. In other embodiments in of the invention, primary pressure regulator **42** (FIG. **5**) is mounted to service valve **40** while secondary pressure regulator **44** (FIG. **5**) is mounted on regulator mounting structure **154**. Alternatively, both primary pressure regulator **42** (FIG. **5**) and secondary pressure regulator **44** (FIG. **5**) may be mounted on regulator mounting structure **154**.

Fuel regulator system **39** may be coupled to service valve **40** by a flexible connector called a pigtail **164**. Pigtail **164** absorbs shock in the system from pressure surges and from movement of downstream components. Pigtail **164** can be looped to conserve space and therefore pressurized fuel container **34** is referred to as an LPG pig. Accordingly, regulator mounting structure **154** is referred to as a pig hat because it fits on the LPG pig. Pressurized fuel container **34** may be secured to a platform or mobile cart **64** for stability or transportation. In another embodiment, a regulator mounting device, including regulator mounting structure **154** or regulator mounting bracket **46** (FIG. **5**), is secured directly to a platform or a mobile cart.

Beneficially, embodiments of the invention provide for a mechanical fuel lockout switch to ensure that two fuels are not simultaneously delivered to a dual fuel internal combustion engine. Embodiments of the invention also provide for a dual fuel generator with a remotely mounted gaseous fuel regulator system.

Therefore, according to one embodiment of the invention, a mechanical fuel lockout switch for a dual fuel engine includes a mechanical fuel valve actuateable between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line. The mechanical fuel lockout switch also includes a fuel lockout apparatus coupled to the mechanical fuel valve. The mechanical fuel lockout switch communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position.

According to another embodiment of the invention, a dual fuel generator and fuel delivery system includes 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 and fuel delivery

system also includes a fuel regulator system located off board the dual fuel generator. The fuel regulator system includes 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. The fuel regulator system also includes 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. The dual fuel generator and fuel delivery system further includes a mechanical fuel valve actuateable 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.

According to yet another embodiment of the invention, a method of assembling a mechanical fuel lockout switch for an internal combustion engine includes providing an internal combustion engine configured to operate on a fuel from a first fuel source and a different fuel from a second fuel source. The method also includes coupling a mechanical fuel valve to the internal combustion engine actuateable between a first position and a second position to selectively control fuel flow to the internal combustion engine from the first fuel source through a first fuel line and the second fuel source through a second fuel line. The method further includes coupling a fuel lockout apparatus to the mechanical fuel valve. When the mechanical fuel valve is in the first position, the fuel lockout apparatus communicates the first fuel source to the internal combustion engine and prevents the second fuel source from coupling to the internal combustion engine, and actuation of the mechanical fuel valve to the second position causes the fuel lockout apparatus to permit the second fuel source to couple to the internal combustion engine, and interrupts the first fuel source communication with the internal combustion engine.

This written description uses examples to disclose the invention, including the best mode, and also to enable any person skilled in the art to practice the invention, including making and using any devices or systems and performing any incorporated methods. The patentable scope of the invention is defined by the claims, and may include other examples that occur to those skilled in the art. Such other examples are intended to be within the scope of the claims if they have structural elements that do not differ from the literal language of the claims, or if they include equivalent structural elements with insubstantial differences from the literal languages of the claims.

What is claimed is:

1. A mechanical fuel lockout switch for a dual fuel engine comprising:

a mechanical fuel valve actuateable between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line; and

a fuel lockout apparatus coupled to the mechanical fuel valve;

wherein the mechanical fuel lockout switch:

communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and

communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position; and

wherein the fuel lockout apparatus is configured to:

prevent the second fuel source from coupling to the second fuel line while the mechanical fuel valve is in the first position; and

permit the second fuel source to couple to the second fuel line while the mechanical fuel valve is in the second position.

2. The mechanical fuel lockout switch for a dual fuel engine of claim **1**, wherein the fuel lockout apparatus prevents actuation of the mechanical fuel valve to the first position when the second fuel source communicates with the dual fuel engine.

3. The mechanical fuel lockout switch for a dual fuel engine of claim **1**, wherein the fuel lockout apparatus comprises a flange rigidly coupled to the mechanical fuel valve that covers an inlet of the second fuel line while the mechanical fuel valve is in the first position and uncovers the inlet of the second fuel line while the mechanical fuel valve is in the second position.

4. The mechanical fuel lockout switch for a dual fuel engine of claim **3**, wherein the mechanical fuel valve rotates between the first position and the second position and the flange rotates transversely across the inlet of the second fuel line.

5. The mechanical fuel lockout switch for a dual fuel engine of claim **3**, further comprising;

a first end of a quick-disconnect hose coupling attached to the inlet of the second fuel line; and

a second end of the quick-disconnect hose coupling attached to the second fuel source to mate with the first end of the quick-disconnect hose coupling to couple the second fuel source to the second fuel line.

6. The mechanical fuel lockout switch for a dual fuel engine of claim **1**, wherein the mechanical fuel valve and the fuel lockout apparatus operate together to ensure that fuel from the first fuel source and fuel from the second fuel source are not simultaneously delivered to the dual fuel engine.

7. The mechanical fuel lockout switch for a dual fuel engine of claim **6**, wherein the first fuel source provides liquid fuel from a liquid fuel tank to the dual fuel engine and the second fuel source provides gaseous fuel from a pressurized fuel container to the dual fuel engine.

8. A method of assembling a mechanical fuel lockout switch for an internal combustion engine comprising:

providing an internal combustion engine configured to operate on a fuel from a first fuel source and a different fuel from a second fuel source;

coupling a mechanical fuel valve to the internal combustion engine actuateable between a first position and a second position to selectively control fuel flow to the internal combustion engine from the first fuel source through a first fuel line and the second fuel source through a second fuel line; and

coupling a fuel lockout apparatus to the mechanical fuel valve;

wherein when the mechanical fuel valve is in the first position, the fuel lockout apparatus communicates the first fuel source to the internal combustion engine and prevents the second fuel source from coupling to the internal combustion engine, and actuation of the mechanical fuel valve to the second position causes the fuel lockout apparatus to permit the second fuel source

to couple to the internal combustion engine, and interrupts the first fuel source communication with the internal combustion engine; and

wherein the fuel lockout apparatus prevents actuation of the mechanical fuel valve to the first position when the second fuel source is coupled to the internal combustion engine.

9. The method of claim **8**, wherein the fuel lockout apparatus is further configured to:

prevent coupling of the second fuel source to the second fuel line while the mechanical fuel valve is in the first position; and

permit coupling of the second fuel source to the second fuel line while the mechanical fuel valve is in the second position.

10. The method of claim **8**, wherein the fuel lockout apparatus comprises a fuel inlet cover configured to actuate in unison with the mechanical fuel valve to cover a fuel inlet on the internal combustion engine for the second fuel source when the mechanical fuel valve is in the first position and uncover the fuel inlet when the mechanical fuel valve is in the second position.

11. The method of claim **8**, further comprising coupling a fuel regulator system to the second fuel source to reduce fuel pressure therefrom and deliver fuel to the second fuel line at a pressure required for operation of the internal combustion engine.

12. The method of claim **11**, further comprising mounting the fuel regulator system to the second fuel source located off-board the internal combustion engine.

13. The method of claim **11**, further comprising:

coupling one end of a quick-disconnect hose coupling to an inlet on the internal combustion engine for the second fuel source; and

coupling a mating end of the quick-disconnect hose coupling to an outlet of the fuel regulator system.

14. The method of claim **8**, further comprising providing gasoline in a liquid fuel tank as the first fuel source and LPG in a pressurized fuel container as the second fuel source.

15. A mechanical fuel lockout switch for a dual fuel engine comprising:

a mechanical fuel valve actuateable between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line; and

a fuel lockout apparatus coupled to the mechanical fuel valve;

wherein the mechanical fuel lockout switch:

communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and

communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position; and

wherein the fuel lockout apparatus prevents actuation of the mechanical fuel valve to the first position when the second fuel source communicates with the dual fuel engine.

* * * * *

EXHIBIT 1002

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO.	: 10,221,780 B2
APPLICATION NO.	: 14/738060
DATED	: March 5, 2019
INVENTOR(S)	: Sarder et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the Title Page

Item (71) Applicant: delete "Chmapion" and substitute therefore -- Champion --.

Signed and Sealed this
Eleventh Day of June, 2024

Katherine Kelly Vidal

Katherine Kelly Vidal
Director of the United States Patent and Trademark Office

UNITED STATES PATENT AND TRADEMARK OFFICE

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United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/738,060	06/12/2015	Mark J. Sarder	CET1090.019	9670

26629 7590 06/11/2024

ZIOLKOWSKI PATENT SOLUTIONS GROUP, SC (ZPS)
136 S WISCONSIN ST
PORT WASHINGTON, WI 53074

EXAMINER
LATHERS, KEVIN ANTHONY

ART UNIT	PAPER NUMBER
3747	

NOTIFICATION DATE	DELIVERY MODE
06/11/2024	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

info@zpatents.com
jmf@zpatents.com
lje@zpatents.com

APPLICATION NO.	ISSUE DATE	PATENT NO.
14/738,060	11-Jun-2024	10221780

ZIOLKOWSKI PATENT SOLUTIONS GROUP, SC (ZPS)
136 S WISCONSIN ST
PORT WASHINGTON, WI 53074

ELECTRONIC CERTIFICATE OF CORRECTION NOTIFICATION

Your electronic certificate of correction is now available, and can be accessed via Patent Center at https://patentcenter.uspto.gov.

The electronic certificate of correction is the official certificate of correction under 35 U.S.C. 254 or 255. For more information, please visit https://www.uspto.gov/electronicgrants.

Patent
Attorney Docket No.: CET1090.019

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Number	:	10,221,780 B2
Issued	:	March 5, 2019
Name of Patentee	:	Sarder et al.
Title of Invention	:	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE

REQUEST FOR CERTIFICATE OF CORRECTION OF PATENT FOR OFFICE'S MISTAKE (37 CFR 1.322)

1. It is noted that errors appear in this patent of a clerical nature or characterized as more fully described below and would not constitute new matter or would not require re-examination. A Certificate of Correction is requested.

2. Attached hereto is Form PTO-1050 which should be suitable for printing.

3. The errors to be corrected are as follows:

On the Title Page

Item (71) Applicant: delete "Chmapion" and substitute therefore -- Champion --.

4. Please send the Certificate to:

Timothy J. Ziolkowski
Ziolkowski Patent Solutions Group, SC
136 South Wisconsin Street
Port Washington, WI 53074

Date: May 15, 2024

/Timothy J. Ziolkowski/
Timothy J. Ziolkowski
Registration No. 38,368
Telephone: (262) 268-8100

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 10,221,780 B2
APPLICATION NO. : 14/738,060
ISSUE DATE : March 5, 2019
INVENTOR(S) : Sarder et al.

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the Title Page

Item (71) Applicant: delete “Chmapion” and substitute therefore -- Champion --.

(Also Form PTO-1050)

MAILING ADDRESS OF SENDER:

Timothy J. Ziolkowski
Ziolkowski Patent Solutions Group, SC
136 South Wisconsin Street
Port Washington, WI 53074

PATENT NO: 10,221,780 B2

Burden Hour Statement: This form is estimated to take 1.0 hour to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, Patent and Trademark Office, Washington DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450

UNITED STATES
PATENT AND TRADEMARK OFFICE

P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
14/738,060	**05/15/2024 12:33:58 PM Z ET**	**CET1090.019**

Title of Invention

DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	10221780
CONFIRMATION #	9670	FILED BY	Robyn Templin
PATENT CENTER #	65535201	FILING DATE	06/12/2015
CUSTOMER #	26629	FIRST NAMED INVENTOR	Mark J. Sarder
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	Timothy Ziolkowski

Documents

TOTAL DOCUMENTS: 1

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
2024.05.15 Req for COC.pdf	2	Request for Certificate of Correction	77 KB

Digest

DOCUMENT	MESSAGE DIGEST(SHA-512)
2024.05.15 Req for COC.pdf	667FB47FFC7A84EB3C98230F1BD2E13D3E06458285DD4D582FDD7A62A96A6101DD6D9ABCA14376DDA21C7C4CEA789576AD9CAB71ED3B14092634646ACC386DC8

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized

by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/738,060	03/05/2019	10221780	CET1090.019	9670

26629 7590 02/13/2019

ZIOLKOWSKI PATENT SOLUTIONS GROUP, SC (ZPS)
136 S WISCONSIN ST
PORT WASHINGTON, WI 53074

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(application filed on or after May 29, 2000)

The Patent Term Adjustment is 605 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (http://pair.uspto.gov).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site http://pair.uspto.gov for additional applicants):

Mark J. Sarder, Waukesha, WI;
Champion Engine Technology, LLC, Sussex, WI;
Aleko D. Sotiriades, Cedarburg, WI;
James J. Dehn, Brookfield, WI;
Leigh Jenison, Hartland, WI;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

IR103 (Rev. 10/09)

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail, fax, or via EFS-Web.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

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INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

26629 7590 12/11/2018
ZIOLKOWSKI PATENT SOLUTIONS GROUP, SC (ZPS)
136 S WISCONSIN ST
PORT WASHINGTON, WI 53074

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

Robyn L. Templin	(Typed or printed name)
Robyn L. Templin	(Signature)
1/11/19	(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/738,060	06/12/2015	Mark J. Sarder	CET1090.019	9670

TITLE OF INVENTION: DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$500	$0.00	$0.00	$500	03/11/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
LATHERS, KEVIN ANTHONY	3747	123-575000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. Use of a Customer Number is required.

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 Ziolkowski Patent Solutions Group, SC
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Champion Power Equipment, Inc.

(B) RESIDENCE: (CITY and STATE OR COUNTRY): Santa Fe Springs, CA

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. Fees submitted: ☒ Issue Fee ☐ Publication Fee (if required) ☐ Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

☐ Electronic Payment via EFS-Web ☐ Enclosed check ☒ Non-electronic payment by credit card (Attach form PTO-2038)

☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. Change in Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date 1/11/19

Typed or printed name Timothy J. Ziolkowski Registration No. 38,368

PTOL-85 Part B (08-18) Approved for use through 01/31/2020 OMB 0651-0033 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

PAGE 1/2 * RCVD AT 1/11/2019 10:48:51 AM [Eastern Standard Time] * SVR:W-PTOFAX-002/2 * DNIS:2732885 * CSID:2622688185 * DURATION (mm-ss):01-03

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NOTICE OF ALLOWANCE AND FEE(S) DUE

26629 7590 12/11/2018

ZIOLKOWSKI PATENT SOLUTIONS GROUP, SC (ZPS)
136 S WISCONSIN ST
PORT WASHINGTON, WI 53074

EXAMINER
LATHERS, KEVIN ANTHONY

ART UNIT	PAPER NUMBER
3747	

DATE MAILED: 12/11/2018

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/738,060	06/12/2015	Mark J. Sarder	CET1090.019	9670

TITLE OF INVENTION: DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$500	$0.00	$0.00	$500	03/11/2019

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PTOL-85 (Rev. 02/11)

PART B - FEE(S) TRANSMITTAL

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Commissioner for Patents
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By fax, send to: (571)-273-2885

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26629 7590 12/11/2018
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I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via EFS-Web or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/738,060	06/12/2015	Mark J. Sarder	CET1090.019	9670

TITLE OF INVENTION: DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$500	$0.00	$0.00	$500	03/11/2019

EXAMINER	ART UNIT	CLASS-SUBCLASS
LATHERS, KEVIN ANTHONY	3747	123-575000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-09 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. Fees submitted: ❑Issue Fee ❑Publication Fee (if required) ❑Advance Order - # of Copies _____

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via EFS-Web ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.
NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.
NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

Exhibit 1003, Page 200
Petitioner MWE Investments, LLC, et al.

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UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/738,060	06/12/2015	Mark J. Sarder	CET1090.019	9670

26629 7590 12/11/2018

ZIOLKOWSKI PATENT SOLUTIONS GROUP, SC (ZPS)
136 S WISCONSIN ST
PORT WASHINGTON, WI 53074

EXAMINER	
LATHERS, KEVIN ANTHONY	
ART UNIT	**PAPER NUMBER**
3747	

DATE MAILED: 12/11/2018

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

PTOL-85 (Rev. 02/11)

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 14/738,060	Applicant(s) Sarder et al.	
	Examiner KEVIN A LATHERS	Art Unit 3747	AIA Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to amendments filed 11/05/2018.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 1-2,4-8,19 and 21-27 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information , please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐All b) ☐ Some *c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file areply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/KEVIN A LATHERS/
Primary Examiner, Art Unit 3747

DETAILED ACTION

Notice of Pre-AIA or AIA Status

1. The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Allowable Subject Matter

2. Claims 1, 2, 4-8, 19, and 21-27 are allowed.

3. The following is an examiner's statement of reasons for allowance: The closest prior art fails to disclose or make obvious the use of a dual fuel lockout switch on a dual fuel internal combustion engine wherein when the lockout switch is in one position it prevents the fuel source from coupling to the fuel system lines of the engine.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEVIN A LATHERS whose telephone number is (571)272-1050. The examiner can normally be reached on M-F 10a-6p.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lindsay Low can be reached on 5712721196. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KEVIN A LATHERS/
Primary Examiner, Art Unit 3747

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/738,060	Sarder et al.
	Examiner	Art Unit
	KEVIN A LATHERS	3747

CPC - Searched*		
Symbol	Date	Examiner
F02D19/0613, 16/0605, 19/0647	07/28/2017	/K.L./
Y02T10/36	07/28/2017	/K.L./

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
EAST including inventor and assignee search.	07/28/2017	/K.L./
Google key word search (e.g. "dual fuel generator").	07/28/2017	/K.L./
EAST and google search.	02/15/2018	/K.L./
Google Search performed	08/29/2018	/K.L./
EAST and google, interference search.	11/20/2018	/K.L./

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner
F02D19	19/0613, 19/0605, 19/0647	11/20/2018	/K.L./
Y02T	10/36	11/20/2018	/K.L./

/KEVIN A LATHERS/ Primary Examiner, Art Unit 3747	

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/738,060	Sarder et al.
	Examiner	Art Unit
	KEVIN A LATHERS	3747

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS										
☐ Claims renumbered in the same order as presented by applicant						☐ CPA		☐ T.D.		☐ R.1.47
CLAIM		DATE								
Final	Original	07/28/2017	02/15/2018	08/29/2018	11/20/2018					
1	1	✓	✓	✓	=					
2	2	✓	O	O	=					
	3	✓	O	O	-					
3	4	O	O	O	=					
4	5	O	O	O	=					
5	6	O	O	O	=					
6	7	✓	✓	✓	=					
7	8	✓	✓	✓	=					
	9	✓	✓	✓	-					
	10	✓	O	O	-					
	11	O	O	O	-					
	12	O	O	O	-					
	13	O	O	O	-					
	14	✓	✓	✓	-					
	15	✓	✓	✓	-					
	16	✓	✓	✓	-					
	17	✓	✓	✓	-					
	18	✓	✓	✓	-					
8	19	✓	✓	✓	=					
	20	✓	O	O	-					
9	21	✓	O	O	=					
10	22	✓	✓	✓	=					
11	23	✓	✓	✓	=					
12	24	✓	✓	✓	=					
13	25	✓	✓	✓	=					
14	26	✓	✓	✓	=					
15	27				=					

Exhibit 1003, Page 207
Petitioner MWE Investments, LLC, et al.

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/738,060	Sarder et al.
	Examiner	**Art Unit**
	KEVIN A LATHERS	3747

CPC								
Symbol							**Type**	**Version**
F02D	/	19	/	0613			F	2013-01-01
F02D	/	19	/	0605			I	2013-01-01
F02D	/	19	/	0647			I	2013-01-01
F02D	/	19	/	0673			I	2013-01-01
Y02T	/	10	/	36			A	2013-01-01

CPC Combination Sets								
Symbol					**Type**	**Set**	**Ranking**	**Version**
	/		/					

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	15	
/KEVIN A LATHERS/ Primary Examiner, Art Unit 3747	20 November 2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	4B

U.S. Patent and Trademark Office — Part of Paper No.: 20181120

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/738,060	Sarder et al.
	Examiner	**Art Unit**
	KEVIN A LATHERS	3747

INTERNATIONAL CLASSIFICATION				
CLAIMED				
F02D	/	19	/	06

NON-CLAIMED				
	/		/	

US ORIGINAL CLASSIFICATION	
CLASS	**SUBCLASS**

CROSS REFERENCES(S)						
CLASS	**SUBCLASS (ONE SUBCLASS PER BLOCK)**					

NONE		Total Claims Allowed:	
(Assistant Examiner)	(Date)	15	
/KEVIN A LATHERS/ Primary Examiner, Art Unit 3747	20 November 2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	4B

U.S. Patent and Trademark Office — Part of Paper No.: 20181120

Issue Classification	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/738,060	Sarder et al.
	Examiner	**Art Unit**
	KEVIN A LATHERS	3747

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIMS

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
1	1		10	8	19										
2	2		11		20										
	3		12	9	21										
3	4		13	10	22										
4	5		14	11	23										
5	6		15	12	24										
6	7		16	13	25										
7	8		17	14	26										
	9		18	15	27										

NONE		**Total Claims Allowed:**	
(Assistant Examiner)	(Date)	15	
/KEVIN A LATHERS/ Primary Examiner, Art Unit 3747	20 November 2018	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	4B

U.S. Patent and Trademark Office — Part of Paper No.: 20181120

Bibliographic Data

Application No: 14/738,060

Foreign Priority claimed: ○ Yes ◉ No

35 USC 119 (a-d) conditions met: ☐ Yes ☐ No ☐ Met After Allowance

Verified and Acknowledged: /Kevin Lathers/ (Examiner's Signature) | (Initials)

Title: DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE

FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
06/12/2015	123	3747	CET1090.019
RULE			

APPLICANTS

Champion Engine Technology, LLC, Sussex, WI, UNITED STATES

INVENTORS

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Aleko D. Sotiriades Cedarburg, WI, UNITED STATES

James J. Dehn Brookfield, WI, UNITED STATES

Leigh Jenison Hartland, WI, UNITED STATES

CONTINUING DATA

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

06/22/2015

** SMALL ENTITY **

STATE OR COUNTRY

UNITED STATES

ADDRESS

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136 S WISCONSIN ST
PORT WASHINGTON, WI 53074
UNITED STATES

FILING FEE RECEIVED

$970

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	445	F02D19/0613.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:25
S2	1204	F02D19/0605.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:25
S3	3408	F02D19/0647.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:25
S4	15258	Y02T10/36.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:25
S5	808	(S1 S2 S3 S4) and (switch valve) near20 (propane natural adj gas gaseous lng cng) near20 (gasoline liquid diesel)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:28
S6	79	(S1 S2 S3 S4) and (switch valve) near20 (propane natural adj gas gaseous lng cng) near20 (gasoline liquid diesel) and (second secondary auxiliary) near5 (regulat$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:29
S7	64	(S1 S2 S3 S4) and (switch valve) near20 (propane natural adj gas gaseous lng cng) near20 (gasoline liquid diesel) and (second secondary auxiliary) adj (regulat$3 pressure)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:44
S8	28	("5450832" | "20130220274" | "5325835"	USPAT	OR	OFF	2017/07/27

		| "5320078" | "4619240" | "6082323" | "6453877" | "5171487" | "6223730" | "6213083" | "4489699" | "5287839" | "8590510" | "5673670" | "4450821" | "5816224" | "6276345" | "4502453" | "20130047964" | "4372276" | "6401685" | "7905469" | "2722208" | "4895124" | "5161496" | "5379740" | "5438968" | "5419291" | "6914342" | "8342158").PN.				14:45
S9	124	("5450832" | "20130220274" | "5325835" | "5320078" | "4619240" | "6082323" | "6453877" | "5171487" | "6223730" | "6213083" | "4489699" | "5287839" | "8590510" | "5673670" | "4450821" | "5816224" | "6276345" | "4502453" | "20130047964" | "4372276" | "6401685" | "7905469" | "2722208" | "4895124" | "5161496" | "5379740" | "5438968" | "5419291" | "6914342" | "8342158").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:45
S10	421	(duel dual) near5 fuel near20 (engine generator) same (switch valve) near20 between	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:46
S11	0	dual adj fuel near20 engine same "switchover valve"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 15:17
S12	44	dual adj fuel near20 engine same (switch switchover) near5 valve	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 15:19
S13	49	"6591817"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 15:19
S14	63	("3799125" | "4150645" | "4265208" | "4303049" | "4305350" | "4323046" | "4353345" | "4391251" | "4398517" | "4524033" | "4671243" | "5450832" | "5524582" | "5623907" | "5720266" | "5816224" | "6035837").PN. OR ("6591817").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 15:20
S15	80	dual adj fuel near20 engine same (switch switchover select$3) near5 valve	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 15:21

S16	30	(("SARDER") near3 ("Mark")).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 15:25
S17	28	(("SOTIRIADES") near3 ("Aleko")).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 15:25
S18	41	(("DEHN") near3 ("James")).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 15:25
S19	15	(("JENISON") near3 ("Leigh")).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 15:25
S20	16	(("CHAMPION") near3 ("ENGINE") near3 ("TECHNOLOGY") near3 ("LLC")).AANM.	USPAT	OR	OFF	2017/07/27 15:25
S21	19	(("CHAMPION") near3 ("ENGINE") near3 ("TECHNOLOGY") near3 ("LLC")).as.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 15:26
S22	5	("20040240141" | "20060169238" | "20130098349" | "20130122439" | "4489699").PN. OR ("9435273").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 15:42
S23	41	("1973142" | "2315882" | "2381304" | "4068639" | "4227497" | "4335697").PN. OR ("4489699").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 15:43
S24	97	(dual multi multiple plural plurality) adj fuel near20 engine same (switch switchover changeover change switch$3) near5 (valve switch)	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 16:02
S25	1	(09/813622).APP.	USPAT; USOCR	OR	OFF	2017/07/27 16:03
S26	63	("3799125" | "4150645" | "4265208" | "4303049" | "4305350" | "4323046" | "4353345" | "4391251" | "4398517" | "4524033" | "4671243" | "5450832" | "5524582" | "5623907" | "5720266" | "5816224" | "6035837").PN. OR ("6591817").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 16:03
S27	64	("4335697" | "4393848" | "4430978" | "4606322" | "4683864" | "4825842" | "4922862" | "5379740" | "5474047" | "5479906" | "5755211" | "5775282").PN. OR ("6035837").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 16:34
S28	27	("5999888" | "6543395" | "4619240" | "20140366577" | "20120168023" | "20140202430" | "4463735" | "5668310" | "5224457").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/28 10:32
S29	0	(14/156204).APP.	USPAT; USOCR	OR	OFF	2017/07/28 11:33
S30	5	(gas gasoline liquid near5 fuel) near20 (propane natural adj gas) near20 (fill$3 fueling) same (quick-connect connect$3) near20 (cover flange)	USPAT; USOCR	OR	OFF	2017/07/28 11:47
S31	109	(gas gasoline liquid near5 fuel) near20 (propane natural adj gas) near20 (fill$3 fueling) same (quick-connect connect$3) near20 (cover flange)	US-PGPUB; USPAT; USOCR; FPRS;	OR	OFF	2017/07/28 11:47

			EPO; JPO; DERWENT; IBM_TDB			
S32	280	(gas gasoline liquid near5 fuel) near20 (propane natural adj gas) near20 (fill$3 fueling) same (cover flange)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/28 11:48
S33	171	(gas gasoline liquid near5 fuel) near20 (propane natural adj gas) near20 (fill$3 fueling) same (cover flange) not S31	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/28 11:48
S34	5	"9435273"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/28 14:35
S35	1	"20070137591"	USPAT	OR	OFF	2018/02/12 15:56
S37	34	(champion near3 engine).as.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/02/12 15:59
S38	95	dual adj fuel near20 valve near10 switch	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/02/12 16:19
S39	48	"4489699"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/02/12 16:30
S40	5	"20070137591"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/02/12 16:30
S41	29	"3412258"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/02/12 16:30

S42	3	"20100258099"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/02/12 16:30
S43	53	"5611312"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/02/12 16:30
S44	138	(S39 S40 S41 S42 S43)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/02/12 16:31
S45	1	(10/591304).APP.	USPAT; USOCR	OR	OFF	2018/02/12 16:45
S46	6	("6332433" | "7146962").PN. OR ("7325519").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/02/12 16:46
S47	35	(US-20020014077-$ or US-20030168024-$ or US-20110168133-$ or US-20120204835-$ or US-20030010320-$ or US-20160363099-$ or US-20170037796-$ or US-20020134362-$ or US-20140202430-$ or US-20160221518-$ or US-20070137591-$).did. or (US-5320078-$ or US-5450832-$ or US-5816224-$ or US-6591817-$ or US-5524582-$ or US-4570605-$ or US-4712516-$ or US-9435273-$ or US-4489699-$ or US-4305350-$ or US-4353345-$ or US-6035837-$ or US-6904873-$ or US-7045916-$ or US-5092305-$).did. or (US-2558884-$ or US-2470747-$ or US-3022425-$ or US-3451424-$).did. or (JP-2004278332-$).did. or (US-20080290531-$ or US-20130047964-$ or US-4463735-$ or CN-203796423-$).did.	US-PGPUB; USPAT; USOCR; JPO; DERWENT	OR	OFF	2018/02/12 17:19
S48	35	(US-20020014077-$ or US-20030168024-$ or US-20110168133-$ or US-20120204835-$ or US-20030010320-$ or US-20160363099-$ or US-20170037796-$ or US-20020134362-$ or US-20140202430-$ or US-20160221518-$ or US-20070137591-$).did. or (US-5320078-$ or US-5450832-$ or US-5816224-$ or US-6591817-$ or US-5524582-$ or US-4570605-$ or US-4712516-$ or US-9435273-$ or US-4489699-$ or US-4305350-$ or US-4353345-$ or US-6035837-$ or US-6904873-$ or US-7045916-$ or US-5092305-$).did. or (US-2558884-$ or US-2470747-$ or US-3022425-$ or US-3451424-$).did. or (JP-2004278332-$).did. or (US-20080290531-	US-PGPUB; USPAT; USOCR; JPO; DERWENT	OR	OFF	2018/02/13 17:40

		$ or US-20130047964-$ or US-4463735-$ or CN-203796423-$).did.				
S50	17	S48 and regulator	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/02/13 17:40

EAST Search History (Interference)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	1	(engine and lockout and fuel and first adj fuel and second adj fuel and source and switch).clm.	US-PGPUB; USPAT	OR	OFF	2018/11/20 15:47
S51	88	F02D19/0613.cpc.	US-PGPUB; USPAT	OR	OFF	2018/11/20 12:06
S52	273	F02D19/0605.cpc.	US-PGPUB; USPAT	OR	OFF	2018/11/20 12:06
S53	747	F02D19/0647.cpc.	US-PGPUB; USPAT	OR	OFF	2018/11/20 12:06
S54	3711	Y02T10/36.cpc.	US-PGPUB; USPAT	OR	OFF	2018/11/20 12:06

11/20/2018 3:47:39 PM
C:\Users\klathers\Documents\EAST\Workspaces\14738060.wsp

Customer No. 26629 Patent
Confirmation No. 9670 Attorney Docket No. CET1090.019

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	Sarder et al.
Serial No.	:	14/738,060
Filed	:	June 12, 2015
For	:	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE
Group Art No.	:	3747
Examiner	:	Kevin A. Lathers

CERTIFICATION UNDER 37 CFR 1.8(a) and 1.10

I hereby certify that, on the date shown below, this correspondence is being:

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37 CFR 1.8(a) **37 CFR 1.10**

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Date: November 5, 2018 /Robyn L. Templin/
Signature

Commissioner for Patents
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Alexandria, VA 22313-1450

AFTER-FINAL
AMENDMENT/RESPONSE TO FINAL OFFICE ACTION
MAILED FEBRUARY 22, 2018

Dear Sir:

Responsive to the Final Office Action mailed September 5, 2018, please amend the Application as follows:

OK TO ENTER: /K.A.L/

PTO/SB/06 (09-11)
Approved for use through 1/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/738,060	Filing Date 06/12/2015	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	11/05/2018	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 15	Minus	** 26	= 0	X $50 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $230 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
TAMARA HARRELL

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Customer No. 26629 Patent
Confirmation No. 9670 Attorney Docket No. CET1090.019

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	Sarder et al.
Serial No.	:	14/738,060
Filed	:	June 12, 2015
For	:	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE
Group Art No.	:	3747
Examiner	:	Kevin A. Lathers

CERTIFICATION UNDER 37 CFR 1.8(a) and 1.10

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37 CFR 1.8(a) **37 CFR 1.10**

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■ transmitted by EFS-WEB addressed to **Examiner Kevin A. Lathers** at the Patent and Trademark Office.

Date: November 5, 2018 /Robyn L. Templin/
Signature

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AFTER-FINAL
AMENDMENT/RESPONSE TO FINAL OFFICE ACTION
MAILED FEBRUARY 22, 2018

Dear Sir:

Responsive to the Final Office Action mailed September 5, 2018, please amend the Application as follows:

In the Claims

1. (Currently Amended) A mechanical fuel lockout switch for a dual fuel engine comprising:

a mechanical fuel valve actuateable between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line; and

a fuel lockout apparatus coupled to the mechanical fuel valve;

wherein the mechanical fuel lockout switch:

communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and

communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position; and

wherein the fuel lockout apparatus is configured to:

prevent the second fuel source from coupling to the second fuel line while the mechanical fuel valve is in the first position; and

permit the second fuel source to couple to the second fuel line while the mechanical fuel valve is in the second position.

2. (Original) The mechanical fuel lockout switch for a dual fuel engine of claim 1, wherein the fuel lockout apparatus prevents actuation of the mechanical fuel valve to the first position when the second fuel source communicates with the dual fuel engine

3. (Canceled)

4. (Currently Amended) The mechanical fuel lockout switch for a dual fuel engine of claim ~~3~~ 1, wherein the fuel lockout apparatus comprises a flange rigidly coupled to the mechanical fuel valve that covers an inlet of the second fuel line while the mechanical fuel valve is in the first position and uncovers the inlet of the second fuel line while the mechanical fuel valve is in the second position.

5. (Original) The mechanical fuel lockout switch for a dual fuel engine of claim 4, wherein the mechanical fuel valve rotates between the first position and the second position and the flange rotates transversely across the inlet of the second fuel line.

6. (Original) The mechanical fuel lockout switch for a dual fuel engine of claim 4, further comprising;

a first end of a quick-disconnect hose coupling attached to the inlet of the second fuel line; and

a second end of the quick-disconnect hose coupling attached to the second fuel source to mate with the first end of the quick-disconnect hose coupling to couple the second fuel source to the second fuel line.

7. (Original) The mechanical fuel lockout switch for a dual fuel engine of claim 1, wherein the mechanical fuel valve and the fuel lockout apparatus operate together to ensure that fuel from the first fuel source and fuel from the second fuel source are not simultaneously delivered to the dual fuel engine.

8. (Original) The mechanical fuel lockout switch for a dual fuel engine of claim 7, wherein the first fuel source provides liquid fuel from a liquid fuel tank to the dual fuel engine and the second fuel source provides gaseous fuel from a pressurized fuel container to the dual fuel engine.

9-18. (Canceled)

19. (Currently Amended) A method of assembling a mechanical fuel lockout switch for an internal combustion engine comprising:

providing an internal combustion engine configured to operate on a fuel from a first fuel source and a different fuel from a second fuel source;

coupling a mechanical fuel valve to the internal combustion engine actuateable between a first position and a second position to selectively control fuel flow to the internal combustion engine from the first fuel source through a first fuel line and the second fuel source through a second fuel line; and

coupling a fuel lockout apparatus to the mechanical fuel valve;

wherein when the mechanical fuel valve is in the first position, the fuel lockout apparatus communicates the first fuel source to the internal combustion engine and prevents the second fuel source from coupling to the internal combustion engine, and actuation of the mechanical fuel valve to the second position causes the fuel lockout apparatus to permit the second fuel source to couple to the internal combustion engine, and interrupts the first fuel source communication with the internal combustion engine; and

wherein the fuel lockout apparatus prevents actuation of the mechanical fuel valve to the first position when the second fuel source is coupled to the internal combustion engine.

20. (Canceled)

21. (Currently Amended) The method of claim ~~20~~19, wherein the fuel lockout apparatus is further configured to:

prevent coupling of the second fuel source to the second fuel line while the mechanical fuel valve is in the first position; and

permit coupling of the second fuel source to the second fuel line while the mechanical fuel valve is in the second position.

22. (Original) The method of claim 19, wherein the fuel lockout apparatus comprises a fuel inlet cover configured to actuate in unison with the mechanical fuel valve to cover a fuel inlet on the internal combustion engine for the second fuel source when the mechanical fuel valve is in the first position and uncover the fuel inlet when the mechanical fuel valve is in the second position.

23. (Original) The method of claim 19, further comprising coupling a fuel regulator system to the second fuel source to reduce fuel pressure therefrom and deliver fuel to the second fuel line at a pressure required for operation of the internal combustion engine.

24. (Original) The method of claim 23, further comprising mounting the fuel regulator system to the second fuel source located off-board the internal combustion engine.

25. (Original) The method of claim 23, further comprising:

coupling one end of a quick-disconnect hose coupling to an inlet on the internal combustion engine for the second fuel source; and

coupling a mating end of the quick-disconnect hose coupling to an outlet of the fuel regulator system.

26. (Original) The method of claim 19, further comprising providing gasoline in a liquid fuel tank as the first fuel source and LPG in a pressurized fuel container as the second fuel source.

27. (New) A mechanical fuel lockout switch for a dual fuel engine comprising:

a mechanical fuel valve actuateable between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line; and

a fuel lockout apparatus coupled to the mechanical fuel valve;

wherein the mechanical fuel lockout switch:

communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and

communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position; and

wherein the fuel lockout apparatus prevents actuation of the mechanical fuel valve to the first position when the second fuel source communicates with the dual fuel engine.

REMARKS

Claims 1-26 are pending in the present application. In the Final Office Action mailed September 5, 2018, the Examiner rejected claims 1 and 7 under 35 U.S.C. §102(a)(1) as being anticipated by Sugimoto et al. (US Pub. 2007/0137591). The Examiner next rejected claims 1, 7, 8, 19, 22, and 26 under 35 U.S.C. §102(a)(1) as being anticipated by Pursifull et al. (US Pub. 2011/0168133). Claims 9, 14-18, and 23-25 were rejected under 35 U.S.C. §103 as being unpatentable over Pursifull et al. in view of Sugimoto et al.

Claims 2-6, 10-13, 20, and 21 were indicated as containing allowable subject matter. Such indication is appreciated.

Rejection under 35 U.S.C. §102(a)(1) as being anticipated by Sugimoto et al.

Claim 1

The Examiner rejected claim 1 under 35 U.S.C. §102(a)(1) as being anticipated by Sugimoto et al. (US Pub. 2007/0137591). Without acquiescing to the rejection, Applicant has amended claim 1 in the present response in order to incorporate the allowable subject matter of claim 3.

As amended, claim 1 calls for a mechanical fuel lockout switch for a dual fuel engine comprising: a mechanical fuel valve actuateable between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line; and a fuel lockout apparatus coupled to the mechanical fuel valve; wherein the mechanical fuel lockout switch: communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position; and wherein the fuel lockout apparatus is configured to: prevent the second fuel source from coupling to the second fuel line while the mechanical fuel valve is in the first position; and permit the second fuel source to couple to the second fuel line while the mechanical fuel valve is in the second position.

In light of the incorporation of the allowable subject matter of claim 3 into claim 1, Applicant believes claim 1 to be in condition for allowance. Applicant therefore respectfully requests withdrawal of the rejection of claim 1 under 35 U.S.C. §102(a)(1) as being anticipated by Sugimoto et al., along with the rejection of all claims dependent therefrom.

Rejection under 35 U.S.C. §102(a)(1) as being anticipated by Pursifull et al.

Claims 1 and 19

The Examiner next rejected claims 1 and 19 under 35 U.S.C. §102(a)(1) as being anticipated by Pursifull et al. (US Pub. 2011/0168133).

Regarding claim 1, as set forth above, Applicant has amended claim 1 to incorporate the allowable subject matter of claim 3. Thus, claim 1 is believed to be in condition for allowance.

Regarding claim 19, without acquiescing to the rejection, Applicant has amended claim 19 in the present response in order to incorporate the allowable subject matter of claim 20.

As amended, claim 19 calls for a method of assembling a mechanical fuel lockout switch for an internal combustion engine comprising: providing an internal combustion engine configured to operate on a fuel from a first fuel source and a different fuel from a second fuel source; coupling a mechanical fuel valve to the internal combustion engine actuateable between a first position and a second position to selectively control fuel flow to the internal combustion engine from the first fuel source through a first fuel line and the second fuel source through a second fuel line; and coupling a fuel lockout apparatus to the mechanical fuel valve; wherein when the mechanical fuel valve is in the first position, the fuel lockout apparatus communicates the first fuel source to the internal combustion engine and prevents the second fuel source from coupling to the internal combustion engine, and actuation of the mechanical fuel valve to the second position causes the fuel lockout apparatus to permit the second fuel source to couple to the internal combustion engine, and interrupts the first fuel source communication with the internal combustion engine; and wherein the fuel lockout apparatus prevents actuation of the mechanical fuel valve to the first position when the second fuel source is coupled to the internal combustion engine.

In light of the incorporation of the allowable subject matter of claim 3 into claim 1 and the incorporation of the allowable subject matter of claim 20 into claim 19, Applicant believes claims 1 and 19 to be in condition for allowance. Applicant therefore respectfully requests withdrawal of the rejection of claims 1 and 19 under 35 U.S.C. §102(a)(1) as being anticipated by Pursifull et al., along with the rejection of all claims dependent therefrom.

Rejection under 35 U.S.C. §103 over Pursifull et al. in view of Sugimoto et al.

Claim 9

The Examiner rejected claim 9 under 35 U.S.C. §103 as being unpatentable over Pursifull et al. in view of Sugimoto et al.

Without acquiescing to the rejection, Applicant has elected to cancel claims 9-18 in the present response. Applicant therefore believes the rejection to be moot.

Canceled & Newly Presented Claims

In the present Response, claims 3, 9-18, and 20 have been canceled and claim 27 has been newly added. New claim 27 combines the allowable subject matter of claim 2 with original claim 1. Accordingly, Applicant believes new claim 27 to be in condition for allowance.

Conclusion

Therefore, in light of at least the foregoing, Applicant respectfully believes that the present application is in condition for allowance. As a result, Applicant respectfully requests timely issuance of a Notice of Allowance for claims 1, 2, 4-8, 19, and 21-27.

No fees are deemed due for entering the claim newly presented herein, as a greater number of claims have been canceled and the total number of independent claims is still three.

Applicant appreciates the Examiner's consideration of these Amendments and Remarks and cordially invites the Examiner to call the undersigned, should the Examiner consider any matters unresolved.

Respectfully submitted,

/Kevin R. Rosin/

Kevin R. Rosin
Registration No. 55,584
Phone 262-268-8100 ext. 16
krr@zpspatents.com

Dated: November 5, 2018
Attorney Docket No.: CET1090.019

P.O. ADDRESS:
Ziolkowski Patent Solutions Group, SC
136 South Wisconsin Street
Port Washington, WI 53074
262-268-8100

General Authorization and Extension of Time

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 50-2623. Should no proper payment be enclosed herewith, as by credit card authorization being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 50-2623. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extensions under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 50-2623. Please consider this a general authorization to charge any fee that is due in this case, if not otherwise timely paid, to Deposit Account No. 50-2623.

/Kevin R. Rosin/

Kevin R. Rosin
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Dated: November 5, 2018
Attorney Docket No.: CET1090.019

P.O. ADDRESS:
Ziolkowski Patent Solutions Group, SC
136 South Wisconsin Street
Port Washington, WI 53074
262-268-8100

Electronic Acknowledgement Receipt

EFS ID:	34206596
Application Number:	14738060
International Application Number:	
Confirmation Number:	9670
Title of Invention:	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE
First Named Inventor/Applicant Name:	Mark J. Sarder
Customer Number:	26629
Filer:	Kevin Roger Rosin./Robyn Templin
Filer Authorized By:	Kevin Roger Rosin.
Attorney Docket Number:	CET1090.019
Receipt Date:	05-NOV-2018
Filing Date:	12-JUN-2015
Time Stamp:	10:10:05
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Response.pdf	133213 53dc24c1b4d76339b26913017fec5a2d5b811d0f	yes	9

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Response After Final Action	1	1
	Claims	2	5
	Applicant Arguments/Remarks Made in an Amendment	6	9
Warnings:			
Information:			
	Total Files Size (in bytes):	133213	

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New Applications Under 35 U.S.C. 111
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/738,060	06/12/2015	Mark J. Sarder	CET1090.019	9670

26629 7590 09/05/2018

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EXAMINER
LATHERS, KEVIN ANTHONY

ART UNIT	PAPER NUMBER
3747	

NOTIFICATION DATE	DELIVERY MODE
09/05/2018	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

info@zpspatents.com
sml@zpspatents.com

Office Action Summary	**Application No.** 14/738,060	**Applicant(s)** Sarder et al.	
	Examiner KEVIN A LATHERS	**Art Unit** 3747	**AIA Status** Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☑ Responsive to communication(s) filed on 05/15/2018.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☑ This action is **FINAL.** 2b) ☐ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5) ☑ Claim(s) 1-26 is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6) ☐ Claim(s) _____ is/are allowed.

7) ☑ Claim(s) 1,7-9,14-19 and 22-26 is/are rejected.

8) ☑ Claim(s) 2-6,10-13 and 20-21 is/are objected to.

9) ☐ Claim(s) _____ are subject to restriction and/or election requirement

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to **PPHfeedback@uspto.gov.**

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☑ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date _____.

4) ☐ Other: _____.

DETAILED ACTION

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Claim Rejections - 35 USC § 102

1. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

> (a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale or otherwise available to the public before the effective filing date of the claimed invention.

2. **Claim(s) 1 and 7 is/are rejected under 35 U.S.C. 102(a)(1) as being clearly anticipated by Sugimoto (US 2007/0137591).**

3. **Regarding claim 1,** Champion discloses mechanical fuel lockout switch (Fig. 1, shown switch system) for a dual fuel engine (Fig. 1, shown engine 30) comprising:

a mechanical fuel valve 12 actuateable between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source 61 through a first fuel line A1 and a second fuel source 71 through a second fuel line A5 (Fig. 1, shown lines and valve); and

a fuel lockout apparatus 63 (a fuel cutoff is coupled via the regulator 62 to the valve 12) coupled to the mechanical fuel valve;

wherein the mechanical fuel lockout switch:

communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position (Para. [0082], the switch

has multiple positions which allow valve 12 connect either of the lines A1 or A4 to line A2 and also activate lockout apparatus 63).

4. **Regarding claim 7,** the mechanical fuel lockout switch for a dual fuel engine of claim 1, wherein the mechanical fuel valve and the fuel lockout apparatus operate together to ensure that fuel from the first fuel source and fuel from the second fuel source are not simultaneously delivered to the dual fuel engine (Para. [0082], the system does not allow two fuels to be delivered simultaneously).

5. Claim(s) 1, 7, 8, 19, 22, and 26 is/are rejected under 35 U.S.C. 102(a)(1) as being clearly anticipated by Pursifull et al (US 2011/0168133)

6. **Regarding claims 1 and 19,** Pursifull discloses a mechanical fuel lockout switch for a dual fuel engine (Fig. 3, shown dual fuel engine with lockout switch) and method of constructing it comprising: a mechanical fuel valve 120 actuateable between a first position and a second position to selectively control fuel flow to the dual fuel engine 102 from a first fuel source 112 through a first fuel line 119 and a second fuel source 134 through a second fuel line 140 (Para. [0025], the valve 120 is a three-way mechanical selection valve); and

7. a fuel lockout apparatus (Controller 128, pumps 136 114, and solenoid valves 118 126) coupled to the mechanical fuel valve (Fig. 1, the lockout apparatus is coupled to the valve 120 via controller 128 and fuel lines 119/140);

8. wherein the mechanical fuel lockout switch: communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position (Para. [0025], [0028], and [0066], the three-way valve and lockout apparatus determine connection of the first or second fuel to the dual fuel engine 102).

9. The apparatus above having all the parts coupled together and therefore being "coupled" and "provided" as per the method in claim 19.

10. **Regarding claim 7,** Pursifull discloses the mechanical fuel lockout switch for a dual fuel engine of claim 1, wherein the mechanical fuel valve and the fuel lockout apparatus operate together to ensure that fuel from the first fuel source and fuel from the second fuel source are not simultaneously delivered to the dual fuel engine (Para. [0025], [0028], and [0066], the lockout apparatus cuts off the fuel supply between the lines).

11. **Regarding claims 8 and 26,** Pursifull discloses the mechanical fuel lockout switch for a dual fuel engine of claims 7 and 19, wherein the first fuel source provides gasoline as liquid fuel from a liquid fuel tank to the dual fuel engine and the second fuel source provides LPG fuel from a pressurized fuel container to the dual fuel engine (Para. [0040], the multi fuel system may be liquid propane (gaseous fuel) and gasoline (liquid fuel)).

12. **Regarding claim 22,** the modified Pursifull discloses the method of claim 19 as disclosed above, wherein the fuel lockout apparatus comprises a fuel inlet cover configured to actuate in unison with the mechanical fuel valve to cover a fuel inlet on the internal combustion engine for the second fuel source when the mechanical fuel valve is in the first position and uncover the fuel inlet when the mechanical fuel valve is in the second position (Para. [0025], [0028], and [0066], the lockout apparatus cuts off the fuel supply between the lines, by considering the line which connects to the lockout valve as a "fuel inlet" then the valve cutting off flow is then covering the inlet to disallow fuel flow).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the

claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 9, 14-18, and 23-25 is/are rejected under 35 U.S.C. 103 as being unpatentable over Pursifull et al (US 2011/0168133) in view of Sugimoto et al (US 2007/0137591).

15. **Regarding claim 9,** Pursifull discloses a dual fuel engine and fuel delivery system comprising:

a dual fuel engine (Fig. 1, shown) 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 (Para. [0040], the multi fuel system may be pressurized liquid propane (gaseous fuel) and gasoline (liquid fuel)); and a mechanical fuel valve actuateable 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 (Para. [0025], [0028], and [0066], the three-way valve and lockout apparatus determine connection of the first or second fuel to the dual fuel engine 102).

16. Pursifull fails to disclose a fuel regulator system located off board the dual fuel engine, the fuel regulator system comprising: 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 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.

17. Sugimoto discloses a dual fuel engine and delivery system (Fig. 1, as shown) wherein the system includes an off-board gaseous fuel system (Fb) which includes an off-board pressure regulator 72 which feeds fuel into an engine system 1 which includes another pressure regulator 62. The inclusion of pressure reduction devices for the gasification of liquid-held fuel allows for an effective cooling of the fuel system and systems (Para. [0010]) while allowing the dual fuel engine to be powered by an external fuel tank attached to it in an off board fashion such as in emergency situations (Para. [0002]).

18. Therefore, it would have been obvious to one of ordinary skill in the art before the filing date of the invention to modify the device of Pursifull with the pressure regulators and gaseous fuel system methods of Sugimoto in order to improve the cooling of the fuel system parts through pressure reduction as well as regulate the pressure from an external attached fuel tank which allows the dual fuel engine system to be used in varying situations such as emergency ones using an external fuel source.

19. Further, the inclusion of multiple pressure regulators in the off-board fuel system, while not disclosed in Pursifull as modified by Sugimotor, would have been an obvious modification of the system of Sugimoto which includes an off-board fuel regulation system including a single regulator 72. It would have been obvious to one having ordinary skill in the art at the time the invention was made to duplicate the regulation system to have a dual-regulator off-board system since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. St. Regis Paper Co. v. Bemis Co., 193 USPQ 8. Further, dual tank regulators are extremely old and well-known in the art to provide on off-board fuel tanks, particularly gaseous ones such as propane/natural gas tanks, as they are more efficient, durable, and effective in their regulation. These types of regulators are often called "dual-stage" or "double-stage" regulators.

20. **Regarding claim 14,** the modified Pursifull discloses the dual fuel generator and fuel delivery system of claim 9, 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 (Fig. 1 of Sugimoto shows that the modification of Pursifull to includes an external source of gaseous fuel and regulators makes use of a connection hose coupling 14).

21. **Regarding claims 15,** the modified Pursifull discloses the dual fuel generator and fuel delivery system of claim 9, further comprising a regulator mounting device (a bracket as per applicant's

disclosure on in Para. [0024] of the disclosure) secured to the pressurized fuel source with at least the secondary pressure regulator mounted on the regulator mounting device (Fig. 1 of Sugimoto which discloses the regulator systems, the regulator 72 shown is attached to the fuel tank system 71).

22. The modified Pursifull fails to specifically note a bracket being used for the fixation of the regulator 72. However, it would have been obvious to one of ordinary skill in the art before the filing date of the invention to attach the regulator 72 using some device wherein a bracket is an extremely old and well-known fixation device and one of ordinary skill in the art would have known to apply a known device and technique of mounting a regulator on a fuel tank, such as a bracket, to yield the predictable results of fixing the regulator to its fuel system.

23. **Regarding claim 16,** the modified Pursifull discloses the dual fuel generator and fuel delivery system of claim 15, but fails to disclose wherein the primary pressure regulator is mounted on the regulator mounting device. The modified Pursifull fails to disclose the two regulators being located in positions where they would be mounted making use of the same mounting bracket.
However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to mount both regulators in a similar location on the same bracket since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

24. **Regarding claim 17,** the modified Pursifull discloses the dual fuel generator and fuel delivery system of claim 16, but fails to disclose wherein the pressurized fuel source comprises a pressurized fuel container having a collar; and wherein the regulator mounting device secures to the collar so that the primary and secondary pressure regulators are positioned adjacent each other along an outer periphery of the collar.

25. In this case the claim pertains to the routine and known art of using propane tanks as a fuel tank source as these devices are well-known in the art to have a "collar" piece which often has regulators attached to it. While the art of Pursifull and Sugimoto never make reference to this specific old and well-

known device, they do make use of fuel tanks that could easily be substituted with them. Therefore, examiner makes official notice that it is old and well-known to make use of standard-in-the-art propane tanks with regulators attached to their collars as this would have allowed the modified Pursifull to make use of the common, cheap, and easy-to-use propane tanks for its regulation and propane tank systems. Some examples of such tanks can be seen at: RVDoctor (Oct. 2010, http://www.rvdoctor.com/2012/10/disconcerting-propane-leaks-on-rv.html) which shows two propane tanks with a regulator attached to their collar; and Nooutage.com (Aug. 27th, 2006, https://web.archive.org/web/20060928183104/http://www.nooutage.com:80/images/BS-7KW_Power_Now_tanks.jpg) which shows propane tanks with regulators attached to their collars.

26. **Regarding claim 18,** the modified Pursifull discloses the dual fuel generator and fuel delivery system of claim 9, but fails to disclose wherein the primary and secondary pressure regulators are integral components of a dual stage pressure regulator.

27. However, It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the regulators into a two-stage regulator, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. Howard v. Detroit Stove Works, 150 U.S. 164 (1893).

28. Claims 23-25 are rejected using Pursifull as modified by Sugimoto in the same manner as applied to claim 9 and its dependent claims above.

29. **Regarding claim 23,** the modified Pursifull discloses the method of claim 19, further comprising coupling a fuel regulator system to the second fuel source to reduce fuel pressure therefrom and deliver fuel to the second fuel line at a pressure required for operation of the internal combustion engine (Fig. 1 of Sugimoto shows the regulators in series reducing pressure).

30. **Regarding claim 24,** the modified Pursifull discloses the method of claim 23, further comprising mounting the fuel regulator system to the second fuel source located off-board the internal combustion engine (Fig. 1 of Sugimoto as modified onto Pursifull and shown).

31. **Regarding claim 25,** the modified Pursifull discloses the method of claim 23, further comprising: coupling one end of a quick-disconnect hose coupling to an inlet on the internal combustion engine for the second fuel source; and coupling a mating end of the quick-disconnect hose coupling to an outlet of the fuel regulator system (Fig. 1 of Sugimoto as modified onto Pursifull and shown).

Allowable Subject Matter

32. Claims 2-6, 10-13, 20, and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

33. Applicant's arguments filed 05/15/2018 have been fully considered but they are not persuasive.

34. Applicant argues in the remarks filed 05/15/2018 that the prior art of Suigmoto et al fails to disclose the limitations of claim 1. The argument is based on the construction of the fuel lockout apparatus and argues that Sugimoto fails to disclose a fuel lockout apparatus coupled to a mechanical fuel valve as they appear to be in separate locations. This argument is also presented as a reason why Pursifull et al fails to disclose the limitations of claims 1 and 19: it lacks a coupling between a fuel lockout apparatus and a mechanical fuel valve.

a. While it is true that the fuel lockout apparatus 63 is not *directly attached* to the selector valve 12, the fuel lockout apparatus 63 is clearly coupled to the valve 12 by way of other pieces. Applicant never specifies the term "couple" to take the meaning of "operationally coupled" or "directly mechanically coupled" and indeed the word "couple" simply means "something that joins or links two things together" (https://www.merriam-webster.com/dictionary/couple). In

this case the two parts are linked together via other parts of the construction, parts A2, A3, and 62 (Fig. 1, shown). A good example of this phrase's use would be a cylinder head *coupled to* a cylinder block even if there was a gasket between them; the two parts don't touch and instead are attached via a gasket/seal. Another example would be a "shaft coupling" which is a common term in the art that involves two shafts which never touch but are "coupled." In this way, two fuel system parts connected to one another via lines or other structures are coupled together.

b. With regards to Pursifull, in a manner similar to Sugimoto, a fuel lockout apparatus embodied in controller 128, pumps 136 114, and solenoids valves 118 126 is *coupled* to a mechanical fuel valve 120. The coupling takes place via the intervening parts of a fuel lines 119/140 as the term "couple" is never given a more specific meaning in the disclosure so a broadest reasonable definition (as quoted above) must be used. Therefore, while it's true the two structures are not in direct contact, they are *coupled.*

c. Examiner notes that the claims can be amended to claim "directly coupled" or "operationally coupled" in order to fulfill the desired claim breadth as per the arguments.

35. With regards to claim 9, applicant argues that the fuel regulator system is claimed to be located "off-board" and that the prior art of Purifull and Sugimoto fail to disclose the fuel regulator system being off board.

d. It is noted that the prior art of Sugimoto is used to remedy this deficiency in the prior art of Pursifull and will be relied upon for teaching of these claim limitations. The claim itself claims "a fuel regulator system located off board the dual fuel generator... comprising." Further, as applicant notes, Sugimoto only discloses a single off-board regulator in its system. However, the addition of another regulator or replacement with a dual-stage (two regulators in one housing) would have been exceedingly obvious and well-known to one of ordinary skill in the art. Therefore the claim remains rejected under Purisfull in view of Sugimoto.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEVIN A LATHERS whose telephone number is (571)272-1050. The examiner can normally be reached on M-F 10a-6p.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lindsay Low can be reached on 5712721196. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KEVIN A LATHERS/
Primary Examiner, Art Unit 3747

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/738,060	Sarder et al.
	Examiner	Art Unit
	KEVIN A LATHERS	3747

CPC - Searched*		
Symbol	Date	Examiner
F02D19/0613, 16/0605, 19/0647	07/28/2017	/K.L./
Y02T10/36	07/28/2017	/K.L./

CPC Combination Sets - Searched*		
Symbol	Date	Examiner

US Classification - Searched*			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

Search Notes		
Search Notes	Date	Examiner
EAST including inventor and assignee search.	07/28/2017	/K.L./
Google key word search (e.g. "dual fuel generator").	07/28/2017	/K.L./
EAST and google search.	02/15/2018	/K.L./
Google Search performed	08/29/2018	/K.L./

Interference Search			
US Class/CPC Symbol	US Subclass/CPC Group	Date	Examiner

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14/738,060	Sarder et al.
	Examiner	Art Unit
	KEVIN A LATHERS	3747

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

CLAIMS										
☑ Claims renumbered in the same order as presented by applicant					☐ CPA		☐ T.D.		☐ R.1.47	
CLAIM		DATE								
Final	Original	07/28/2017	02/15/2018	08/29/2018						
	1	✓	✓	✓						
	2	✓	O	O						
	3	✓	O	O						
	4	O	O	O						
	5	O	O	O						
	6	O	O	O						
	7	✓	✓	✓						
	8	✓	✓	✓						
	9	✓	✓	✓						
	10	✓	O	O						
	11	O	O	O						
	12	O	O	O						
	13	O	O	O						
	14	✓	✓	✓						
	15	✓	✓	✓						
	16	✓	✓	✓						
	17	✓	✓	✓						
	18	✓	✓	✓						
	19	✓	✓	✓						
	20	✓	O	O						
	21	✓	O	O						
	22	✓	✓	✓						
	23	✓	✓	✓						
	24	✓	✓	✓						
	25	✓	✓	✓						
	26	✓	✓	✓						

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (02-18)
Approved for use through 11/30/2020. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	14738060
Filing Date	2015-06-12
First Named Inventor	Mark J. Sarder et al.
Art Unit	3747
Examiner Name	Kevin A. Lathers
Attorney Docket Number	CET1090.019

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	3384059		1968-05-21	Kopa	
	2	3412258		1968-11-19	Satter	
	3	3659574		1972-05-02	Reschke et al.	
	4	3718000		1973-02-27	Walker	
	5	3783849		1974-01-08	Bramfitt	
	6	3888223		1975-06-10	Mondt	
	7	4335697		1982-06-22	McLean	
	8	4373493		1983-02-15	Welsh	

EFS Web 2.1.18

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /K.A.L/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14738060
	Filing Date	2015-06-12
	First Named Inventor	Mark J. Sarder et al.
	Art Unit	3747
	Examiner Name	Kevin A. Lathers
	Attorney Docket Number	CET1090.019

	9	4480595		1984-11-06	Hobby et al.	
	10	4628871		1986-12-16	Glass	
	11	4708094		1987-11-24	Helmich et al.	
	12	4979480		1990-12-25	Daikoku et al.	
	13	5092305		1992-03-03	King	
	14	5228423		1993-07-20	Oikawa et al.	
	15	5611312		1997-03-18	Swanson et al.	
	16	6591817	B2	2003-07-15	Deutsch	

If you wish to add additional U.S. Patent citation information please click the Add button. Add

U.S.PATENT APPLICATION PUBLICATIONS Remove

Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	20020134362	A1	2002-09-26	Deutsch	

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /K.A.L/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
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	Filing Date	2015-06-12
	First Named Inventor	Mark J. Sarder et al.
	Art Unit	3747
	Examiner Name	Kevin A. Lathers
	Attorney Docket Number	CET1090.019

	2	20040139943	A1	2004-07-22	Kern et al.	
	3	20100258099	A1	2010-10-14	Andersson et al.	
	4	20110253102	A1	2011-10-20	Watanabe	
	5	20140238340	A1	2014-08-28	Dunn et al.	
	6	20140373531	A1	2014-12-25	Wong	
	7	20150122230	A1	2015-05-07	Sarder et al.	

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Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] i	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]

EFS Web 2.1.18

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	Art Unit	3747
	Examiner Name	Kevin A. Lathers
	Attorney Docket Number	CET1090.019

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Examiner Signature	/KEVIN A LATHERS/	Date Considered	08/29/2018

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14738060
	Filing Date	2015-06-12
	First Named Inventor	Mark J. Sarder et al.
	Art Unit	3747
	Examiner Name	Kevin A. Lathers
	Attorney Docket Number	CET1090.019

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A certification statement is not submitted herewith.

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Signature	/Kevin R. Rosin/	Date (YYYY-MM-DD)	2018-05-15
Name/Print	Kevin R. Rosin	Registration Number	55584

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Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)
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Art Unit	3747
Examiner Name	Kevin A. Lathers
Attorney Docket Number	CET1090.019

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	1	2060477	CN	U	1990-08-15	Zhao Yunying		

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Examiner Signature	/KEVIN A LATHERS/	Date Considered	08/29/2018

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Signature	/Stephanie M. Laundre/	Date (YYYY-MM-DD)	2018-02-22
Name/Print	Stephanie M. Laundre	Registration Number	65124

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Doc code: IDS
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Art Unit	3747
Examiner Name	Kevin A. Lathers
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	1	1981121	CN	A	2007-06-13	Honda Motor Co., Ltd.		

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14738060
	Filing Date	2015-06-12
	First Named Inventor	Mark J. Sarder et al.
	Art Unit	3747
	Examiner Name	Kevin A. Lathers
	Attorney Docket Number	CET1090.019

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☒ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☒ See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Kevin R. Rosin/	Date (YYYY-MM-DD)	2018-06-01
Name/Print	Kevin R. Rosin	Registration Number	55584

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Patent
Attorney Docket No. CET1090.019

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	Sarder et al.
Serial No.	:	14/738,060
Filed	:	June 12, 2015
For	:	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE
Group Art No.	:	3747
Examiner	:	Kevin A. Lathers

CERTIFICATION UNDER 37 CFR 1.8(a) and 1.10

I hereby certify that, on the date shown below, this correspondence is being:

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INFORMATION DISCLOSURE STATEMENT
CERTIFICATION STATEMENT UNDER 37 CFR 1.704(D)(1)

Dear Sir:

Each item of information contained in this information disclosure statement was first cited in any communication from a patent office in a counterpart foreign or international application or from the Office, and this communication was not received by an individual designated under 37 CFR 1.56(c) more than thirty (30) days prior to the filing of this information disclosure statement.

Dated: June 1, 2018
Attorney Docket No.: CET1090.019

Respectfully submitted,

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Bibliographic data: CN1981121 (A) — 2007-06-13

Engine generator

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Classification: **- international:** ***F01P5/06; F02B63/04; F02M21/02; F02M21/06***
- cooperative: **F02B43/00**; **F02B63/04**; **F02D19/022**; **F02D19/027**; **F02D19/0615**; **F02D19/0647**; **F02D19/0676**; **F02D29/06**; **F02M21/0224**; **F02M21/0287**; **F02M21/029**; **F02M21/06**; F01P5/06; F01P9/02; F02B63/044; F02M21/047; Y02T10/32; Y02T10/36

Application number: CN2005822860 20050920

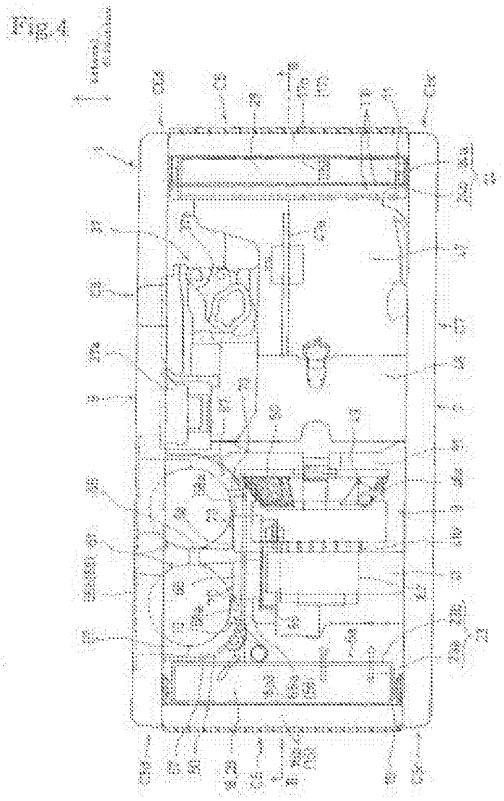
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Abstract of CN1981121 (A)

An engine generator (1), comprising an engine (30), a generator (40) driven by the engine (30), and a power control unit (41) controlling a power generated by the generator (40). A gas fuel stored, in a liquefied state, in cassette cylinders (61) stored in the case (C) of the engine generator (1) is supplied to the engine (30) through a fuel pressure regulator (62). The cassette cylinders (61) and the fuel pressure regulator (62) are disposed in proximity to the power control unit (41) so that the heat exchange thereof with the power control unit (41) with an inverter can be performed. As a result, heat can be mutually utilized between at least one of the cassette cylinders (61) as fuel containers and the fuel pressure regulator (62) and the power control unit (41) in the engine generator (1).

Fig.4



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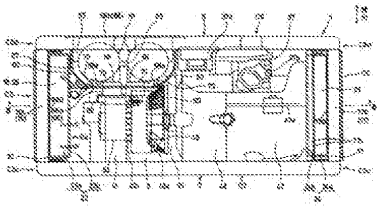
权利要求书 2 页 说明书 25 页 附图 10 页

[54] 发明名称

发动机发电机

[57] 摘要

本发明提供一种发动机发电机(1)，其具有：发动机(30)；发电机(40)，其由发动机(30)驱动；和电力控制单元(41)，其控制发电机(40)产生的电力。在容纳于发动机发电机(1)的箱体(C)内的盒式高压储气瓶(61)中，以液化状态储存有气体燃料，该气体燃料通过燃料压力调节器(62)而被供给发动机(30)。盒式高压储气瓶(61)和燃料压力调节器(62)接近电力控制单元(41)来进行配置，以便能够与具有变流器的电力控制单元(41)进行热交换。从而，在发动机发电机(1)中，在作为燃料容器的盒式高压储气瓶(61)和燃料压力调节器(62)中的至少一方与电力控制单元(41)之间，相互利用热量。



1．一种发动机发电机，该发动机发电机具有：燃料容器，其将气体燃料以液化状态储存；发动机，其被供给来自该燃料容器的气体燃料；燃料压力调节器，其调节从所述燃料容器供给到所述发动机的气体燃料的压力；发电机，其由所述发动机驱动；和电力控制单元，其控制所述发电机所产生的电力，所述发动机发电机的特征在于，

所述燃料容器和所述燃料压力调节器中的至少一方接近所述电力控制单元来进行配置，以便能够与所述电力控制单元进行热交换。

2．如权利要求1所述的发动机发电机，其特征在于，

所述发动机发电机具有容纳所述燃料容器的容纳室；所述燃料容器与所述容纳室的室壁通过由热的良导体构成的传热部件进行热连接；所述室壁接近所述电力控制单元来进行配置，以便能够与所述电力控制单元进行热交换。

3．如权利要求2所述的发动机发电机，其特征在于，

所述传热部件是以与所述燃料容器和所述容纳室的室壁相接触的方式介于所述传热部件与所述容纳室的室壁之间的多个柱状部件。

4．如权利要求1所述的发动机发电机，其特征在于，

所述燃料容器和所述燃料压力调节器中的至少一方与所述电力控制单元通过由热的良导体构成的传热部件进行热连接，或者直接进行热连接。

5．如权利要求1至4中任一项所述的发动机发电机，其特征在于，

所述电力控制单元具有变流器。

6．如权利要求1至4中任一项所述的发动机发电机，其特征在于，

所述发动机发电机具有箱体，所述箱体形成容纳所述燃料容器、所述发动机以及所述发电机的内部空间，

被导入所述内部空间的冷却风以顺次冷却所述燃料容器和所述电力控制单元后，冷却所述发电机和所述发动机的方式形成冷却风通路。

7．如权利要求6所述的发动机发电机，其特征在于，

相对于所述容纳室的室壁，在所述容纳室的相反侧，配置有所述燃料

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压力调节器和所述电力控制单元，并且，所述电力控制单元位于所述燃料压力调节器的下侧。

8. 如权利要求 7 所述的发动机发电机，其特征在于，

所述箱体沿其一侧壁的上部具有空气导入口；所述燃料压力调节器设于所述空气导入口的下游。

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发动机发电机

技术领域

本发明涉及一种发动机发电机，该发动机发电机具有发动机和由该发动机驱动的发电机，以液化状态储存在燃料容器中的气体燃料被供给所述发动机。

背景技术

发动机发电机被广泛用作室外的临时电源，或是紧急情况下的电源。而且，发动机发电机例如在用作休闲用品或防灾用品的情况下，大多使用以储存在小型燃料容器例如盒式高压储气瓶中的气体燃料来作为燃料的燃气发动机。

可是，气体燃料以液化状态储存在燃料容器中，当向燃气发动机供给时，是以气化的状态进行供给。因此，当燃气发动机运转从而开始向该发动机供给气体燃料时，在燃料容器中，由于为了维持液相和气相的平衡状态，伴随着气体压力的降低，液态的气体燃料气化，所以夺取了大量的气化热，使得燃料容器的温度降低。此外，即使在调节气体燃料压力的燃料压力调节器中，也会由于刚气化后的被冷却了的气体燃料的流入或气体燃料的减压而使其温度降低。

而且，当燃料容器等的温度过度降低时，由于气体燃料的气化变得不充分等而使压力降低，从而气体燃料的供给不能顺利进行。为了防止这样的状况，就要根据燃料容器的温度或气体压力来加热燃料容器，这已为大家所知（例如，参照专利文献1、2）。

另一方面，在发动机发电机中，对发电机所产生的电力进行控制的电力控制单元由于其动作引起的发热量很大，所以公知有各种用于冷却电力控制单元的结构。例如，在专利文献3中公开有这样的技术：发动机发电机具有隔音罩，该隔音罩中容纳有发动机、发电机和控制电路单元（相当

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于电力控制单元），在该发动机发电机中，在收纳控制电路单元的箱体上设置散热翼片，该散热翼片面对着取入冷却风的进风口，并与形成有进风口的端壁抵接。

专利文献 1：日本国特开平 10-131810 号公报；

专利文献 2：日本国特许第 2671015 号公报；

专利文献 3：日本国实开昭 63-171632 号公报。

在通过加热器来对储存有气体燃料的燃料容器进行加热的情况下，存在要对加热器的设计方法或加热方法进行设计等的问题、以及结构和控制方法的复杂化所带来的问题。进一步讲，在通过冷却风来冷却电力控制单元的情况下，存在着电力控制单元及其周边部件的配置受到制约或结构复杂化所带来的问题。

发明内容

本发明是鉴于如上状况，着眼于伴随着发动机发电机的运转，以液化状态储存的气体燃料的燃料容器处于温度降低的倾向，而相反，电力控制单元却处于温度上升的倾向而完成的，本发明的主要目的在于，在发动机发电机中，在燃料容器和燃料压力调节器中的至少一方与电力控制单元之间，相互利用彼此的热。本发明的再一目的在于，能够高效地进行通过燃料容器对电力控制单元的冷却和通过电力控制单元对燃料容器的加热，以及增大燃料容器和电力控制单元的配置自由度。本发明的另一目的在于，进一步提高燃料容器和燃料压力调节器中的至少一方对电力控制单元的冷却效果、以及电力控制单元对燃料容器和燃料压力调节器中的至少一方的加热效果；提高冷却风对电力控制单元、发电机以及发动机的冷却效果；在对切换损失大且发热量大的变流器进行冷却的同时，利用电力控制单元的变流器的热量来高效地加热燃料容器和燃料压力调节器中的至少一方。

为达成上述目的，本发明的发动机发电机具有：燃料容器，其将气体燃料以液化状态储存；发动机，其被供给来自该燃料容器的气体燃料；燃料压力调节器，其调节从所述燃料容器供给到所述发动机的气体燃料的压力；发电机，其由所述发动机驱动；和电力控制单元，其控制所述发电机

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所产生的电力，所述发动机发电机的特征在于，所述燃料容器和所述燃料压力调节器中的至少一方接近所述电力控制单元来进行配置，以便能够与所述电力控制单元进行热交换。

根据这样的结构，由于在发动机发电机的运转中，通过燃料的气化等而成为低温的燃料容器和燃料压力调节器中的至少一方接近配置在可与电力控制单元进行热交换的位置，所以，从电力控制单元的散热量增加，换言之，通过燃料容器和燃料压力调节器中的至少一方促进了电力控制单元的冷却，从而抑制了电力控制单元的温度上升。同时，燃料容器和燃料压力调节器中的至少一方被电力控制单元加热，从而抑制了其温度降低。

在本发明的发动机发电机中，也可采用这样的结构，即：所述发动机发电机具有容纳所述燃料容器的容纳室；所述燃料容器与所述容纳室的室壁通过由热的良导体构成的传热部件进行热连接；所述室壁接近所述电力控制单元来进行配置，以便能够与所述电力控制单元进行热交换。

根据这样的结构，由于燃料容器中的从电力控制单元的受热，以及电力控制单元的散热都通过燃料容器的能传递热量的室壁进行，所以，为了在燃料容器与电力控制单元之间进行热交换，燃料容器和电力控制单元的配置就很少受到制约。此外，通过加大室壁或使室壁接近电力控制单元等的室壁的形状或配置，能够增加燃料容器与电力控制单元之间的传热量，从而能够提高燃料容器和电力控制单元相互之间的热利用率。

优选所述电热部件是以与所述燃料容器和所述容纳室的室壁相接触的方式介于所述传热部件与所述容纳室的室壁之间的多个柱状部件。

在本发明的发动机发电机中，所述燃料容器和所述燃料压力调节器中的至少一方与所述电力控制单元通过由热的良导体构成的传热部件进行热连接，或者直接进行热连接。

根据这样的结构，燃料容器和燃料压力调节器中的至少一方与电力控制单元之间的传热通过传热部件利用热传导进行，因此，能够进一步提高相互之间的热的利用率。

所述电力控制单元可以具有变流器。

根据这样的结构，由于变流器的切换损失大，发热量大，所以，通过

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其动作而成为高温的变流器被燃料容器和燃料压力调节器中的至少一方高效地冷却，从而抑制了其温度上升；燃料容器和燃料压力调节器中的至少一方被高温的变流器高效地加热，从而抑制了其温度降低。

优选所述发动机发电机具有箱体，所述箱体形成容纳所述燃料容器、所述发动机以及所述发电机的内部空间；被导入所述内部空间的冷却风以顺次冷却所述燃料容器和所述电力控制单元后，冷却所述发电机和所述发动机的方式形成冷却风通路。

根据这样的结构，被导入箱体内部空间的冷却风被燃料容器冷却而成为更低的温度，该成为低温的冷却风首先冷却电力控制单元，然后冷却发电机和发动机。此外，电力控制单元通过与燃料容器和燃料压力调节器中的至少一方进行热的相互利用，与不进行热的相互利用的情况相比，由于成为低温，所以比冷却电力控制单元后的冷却风的温度还低。

优选采用这样的结构：相对于所述容纳室的室壁，在所述容纳室的相反侧，配置有所述燃料压力调节器和所述电力控制单元，并且，所述电力控制单元位于所述燃料压力调节器的下侧。

此外，可以使所述箱体沿其一侧壁的上部具有空气导入口；所述燃料压力调节器设于所述空气导入口的下游。

发明效果

根据本发明，可以达到如下的效果。即，通过在燃料容器和燃料压力调节器中的至少一方与电力控制单元之间相互利用彼此的热，来抑制电力控制单元的温度上升，因此，能够使电力控制单元的散热结构小型化；此外，由于抑制燃料容器和燃料压力调节器中的至少一方的温度降低，所以，或者可以不需要加热装置来加热燃料容器或燃料压力调节器，或者可以使加热装置的加热量减少，从而能够利用较低温度的加热源等，增加了加热源的选择项，此外，在加热源是电加热器的情况下，能够使其消耗电力减少。

根据本发明的优选实施方式，除了上述效果，还可达成如下的效果。即，通过室壁使燃料容器和电力控制单元的热被相互利用，在此基础上，使燃料容器和电力控制单元的配置自由度变大，此外，可以提高燃料容器

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和电力控制单元相互之间的热的利用率，从而能够进一步高效地进行燃料容器对电力控制单元的冷却，以及电力控制单元对燃料容器的加热。

在本发明的实施方式中，还可进一步达成如下的效果。即，由于可以进一步提高燃料容器和燃料压力调节器中的至少一方与电力控制单元的相互之间的热的利用率，所以能够进一步提高燃料容器和燃料压力调节器中的至少一方对电力控制单元的冷却效果，以及电力控制单元对燃料容器和燃料压力调节器中的至少一方的加热效果。

在本发明的实施方式中，还可进一步达成如下的效果。即，通过温度更低的冷却风能够更高效地冷却电力控制单元，同时，发电机和发动机也能够获得更高的冷却效果。

在本发明的实施方式中，还可进一步达成如下的效果。即，能够高效地冷却发热量大的变流器，并且，能够通过变流器高效地加热燃料容器和燃料压力调节器中的至少一方。

附图说明

图 1 表示本发明的第一实施方式，是应用了本发明的发动机发电机的结构示意图。

图 2 是图 1 的发动机发电机的立体图。

图 3 是在图 2 的发动机发电机中，拆下左盖后的左侧视图，对于前盖、后盖和上盖，是沿图 4 的III-III线的截面图。

图 4 是在图 2 的发动机发电机中，拆下上盖后的俯视图。

图 5 是图 2 的发动机发电机的主视图。

图 6 是图 2 的发动机发电机的燃料切换阀和加热装置中的电路图。

图 7 是表示图 2 的发动机发电机的燃料切换阀的操作位置、燃料供给装置和点火装置之间的关系的表格。

图 8 表示本发明的第二实施方式，是相当于图 3 的图。

图 9 是在本发明的第二实施方式中，相当于图 4 的图。

图 10 表示本发明的其它实施方式，是相当于图 3 的部分的图。

标号说明

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1 … 发动机发电机

3 … 下盖

4 … 上盖

5 … 前盖

6 … 后盖

7 … 左盖

8 … 右盖

9 … 内部空间

12 … 燃料切换阀

16、17、90 … 把持部

18、19、92 … 导入口

20 … 排出口

23、24、91 … 凹部

28、29、93 … 把持用空间

30 … 发动机

40 … 发电机

41 … 电力控制单元

42 … 火花塞

44 … 点火线圈

45 … 冷却风扇

46 … 反冲起动器

47 … 护罩

48 … 风扇罩

49 … 起动器罩

50、51 … 流入口

60 … 容纳部

61 … 盒式高压储气瓶

62 … 燃料压力调节器

63 … 燃料截止阀

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65 … 容纳室

66 … 室壁

68 … 安装传感器

70 … 传热部件

71 … 外部高压气瓶

73 … 燃料压力传感器

74 … 切断开关

75 … 主开关

80 … 加热装置

89 … ECU

C … 箱体

Fa … 燃料供给装置

具体实施方式

以下，参照图 1～图 10 说明本发明的实施方式。

图 1～图 7 表示第一实施方式。参照图 1，应用了本发明的便携式发动机发电机 1 可适当地与设置在该发动机发电机 1 外部的外部燃料系统 Fb 连接。

一并参照图 2、图 3，发动机发电机 1 具有：箱体 C，该箱体 C 大体为长方体的箱状；搬运用的一对把持部 16、17，该把持部 16、17 设置在箱体 C 上，供搬运发动机发电机 1 时把持；发动机 30，该发动机 30 由作为内燃机的燃气发动机构成；燃料供给装置 Fa，该燃料供给装置 Fa 将气体燃料供给到发动机 30；发电机 40，该发电机 40 是由发动机 30 驱动的工作机械；电力控制单元 41，该电力控制单元 41 对发电机 40 所产生的电力进行控制；电子控制单元 89（以下，称为 ECU 89），该 ECU 89 是控制发动机 30 和燃料供给装置 Fa 的控制装置。发动机 30、燃料供给装置 Fa、发电机 40、电力控制单元 41 以及 ECU 89 被箱体 C 包围，从而被容纳在由该箱体 C 形成的内部空间 9 中。由此，箱体 C 构成抑制发动机 30 的运转噪声泄漏到外部的隔音式的箱体 C。

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并且，在说明书和权利要求书中，所谓对把持部 16、17 进行把持，包括用手握住把持部 16、17 的情况和将手按在把持部 16、17 上的情况。

参照图 2～图 5，箱体 C 具有：下盖 3 和上盖 4，该下盖 3 和上盖 4 在作为基准方向的上下方向上相对；前盖 5 和后盖 6，该前盖 5 和后盖 6 是在垂直于上下方向的第一方向上相对的一对侧部盖；左盖 7 和右盖 8，该左盖 7 和右盖 8 是在与上下方向和第一方向垂直的第二方向上或是横向上相对的一对侧部盖。这些盖 3～8 都是合成树脂制成的。

在本实施方式中，第一方向与前后方向一致，第一方向上的一个侧方或另一侧方是前方或后方；此外，第二方向与左右方向一致，第二方向上的一个侧方或另一侧方是左方或右方。

当从下方、上方、前方、后方、左方以及右方对箱体 C 进行观察时，此时的箱体 C 的下表面、上表面、前表面、后表面、左表面以及右表面分别是由上述盖 3～8 构成的箱体 C 中的箱体下部 C3、箱体上部 C4、箱体前部 C5、箱体后部 C6、箱体左部 C7 以及箱体右部 C8 的外表面。因此，下盖 3、上盖 4、前盖 5、后盖 6、左盖 7 和右盖 8 分别主要构成箱体下部 C3、箱体上部 C4、箱体前部 C5、箱体后部 C6、箱体左部 C7 以及箱体右部 C8。进而，前表面、后表面、左表面以及右表面是箱体 C 的四个侧面：箱体前部 C5、箱体后部 C6、箱体左部 C7 以及箱体右部 C8 是箱体 C 的四个箱体侧部。

前盖 5 和后盖 6 分别结合到一对作为加强部件的加强板 10、11 上，该加强板 10、11 由金属制成，且配置在内侧并与下盖 3 结合。然后，左盖 7 结合到各加强板 10、11 上；可开闭的右盖 8 在下端部 8b 被枢轴支撑在下盖 3 上，在上端部 8a 被卡止装置（未图示）卡止于上盖 4。此外，在各加强板 10、11 上，在比加强板 10、11 更位于内侧的前盖 5 或后盖 6 上形成一部分（例如凹部 23、24）贯通的孔（参照图 3）。此处，内侧和外侧的意思分别是指靠近内部空间 9 和靠近箱体 C 的外部。

参照图 3、图 5，在构成操作板部 5e 的前盖 5 上设置有：燃料切换阀 12；输出用插座 13，用于对电气的外部负载供给电流；外部燃料用连接器 14，用于与配置在发动机发电机 1 外部的外部高压储气瓶 71（参照图 1）

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进行连接；以及指示灯 15a、15b、15c 等。

参照图 2～图 5，在前盖 5 的上部所包括的上端部 5a 上，在设有第一把持部 16 的同时，还设有一个导入口 18，该导入口 18 在发动机 30 运转过程中将外部空气作为冷却风导入到箱体 C 的内部空间 9。另一方面，隔着发动机发电机 1 和电力控制单元 41 而在前后方向上与前盖 5 相对的后盖 6 上形成有：排出口 20，用于将对电力控制单元 41、发电机 40 和发动机 30 进行冷却后的冷却风排出到外部；排气口 21，用于将发动机 30 的废气排出到外部。

当提起发动机发电机 1 进行搬运时搬运者的手所把持的部分，即第一、第二把持部 16、17，分别设置在箱体前部 C5 和箱体后部 C6 的上部 C5a、C6a 所包括的上端部。第一把持部 16 被设置为第一拐角部件，其设置在与上盖 4 大体相同的高度位置，并设置在上盖 4 的前方且前盖 5 的上方；第二把持部 17 被设置为第二拐角部件，其设置在与上盖 4 大体相同的高度位置，并设置在上盖 4 的后方且后盖 6 的上方。设置在箱体 C 的前上角部和后上角部的上述两拐角部件的整体是形成第一把持部 16 和第二把持部 17 的把持部形成部件。

第一、第二把持部 16、17 都是合成树脂制的相同的部件，分别具有上部 16a、17a 和下垂部 16b、17b，该上部 16a、17a 通过密封部件 22（参照图 3）与上盖 4 相抵，并构成箱体上部 C4 的前后方向上的两端部；该下垂部 16b、17b 从上部 16a、17a 以与前盖 5 和后盖 6 相对的方式向下方延伸。下垂部 16b、17b 向下方延伸，使得在发动机发电机 1 被提起时，能够用手从外侧部分 16b1、17b1 经由最下端 16b2、17b2 直到内侧部分 16b3、17b3 进行把持。而且，两最下端 16b2、17b2 分别位于与前盖 5 和后盖 6 的上端部 5a、6a 在该上端部 5a、6a 的横向全长中在上下方向上重叠的位置，在本实施方式中，位于与前盖 5 和后盖 6 的后述的凹部 23、24 在该凹部 23、24 的横向整体中在上下方向重叠的位置。

第一把持部 16 被设置为到达箱体前部 C5 的横向上的两端部 C5c、C5d，并在横向上的两端部通过焊接等与前盖 5 结合为一体。而且，第二把持部 17 被设置为到达箱体后部 C6 的横向上的两端部 C6c、C6d，并在

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横向上的两端部通过焊接等与后盖 6 结合为一体。箱体前部 C5 的横向上的两端部 C5c、C5d 和箱体后部 C6 的横向上的两端部 C6c、C6d 分别是由左盖 7 和右盖 8 构成的部分，或者是在横向上与箱体左部 C7 和箱体右部 C8 相对应的部分。如图 4 所示，第一、第二把持部 16、17 整体在横向上的宽度（以下，将在横向上的宽度称为横宽）分别与前盖 5 的横宽和后盖 6 的横宽大体相等，此外，还与左盖 7 和左盖 7 在横向上的间隔大体相等。

第一把持部 16 与形成在前盖 5 的上端部 5a 上的凹部 23 一起形成导入口 18。凹部 23 位于比第一把持部 16 更靠近内部空间 9 的位置，并且进入内部空间 9 中。凹部 23 具有：倾斜部 23a，该倾斜部 23a 从操作板部 5e 起，越是向上方越是在前后方向上向内部空间 9 倾斜；里部 23b，该里部 23b 从倾斜部 23a 起大体与上下方向平行地向上方延伸。凹部 23 延伸成大体到达第一把持部 16 在横向上的两端部，并且该凹部 23 具有与第一把持部 16 的横宽相比，虽然稍小但大体相等的横宽。

而且，在最下端 16b2 与倾斜部 23a 之间形成导入口 18 的入口 18a（在图 3 中用双点划线表示），该入口 18a 朝前方并向斜下方敞开；在第一把持部 16 的上部 16a 与里部 23b 的上端部之间，形成导入口 18 的出口 18b（在图 3 中用双点划线表示）。此外，入口 18a 形成在第一把持部 16 的下方，导入口 18 被设置为大体到达箱体前部 C5 在横向上的两端部 C5c、C5d。导入口 18 的横宽大体与前盖 5 的横宽、以及左盖 7 和左盖 7 在左右方向上的间隔大体相等。从而，从入口 18a 流入的冷却风沿前后方向流向内部空间 9，然后沿下垂部 16b 的内侧部分 16b3 和里部 23b 偏向上方而流动，再通过上部 16a 在前后方向上向内部空间 9 偏转，然后从出口 18b 流出到内部空间 9 中。这样，第一把持部 16 和凹部 23 将导入口 18 形成为多处弯折的迷宫状的通路。

此外，在前盖 5 中，左右侧缘部 5c、5d 比操作板部 5e 向前方突出，第一把持部 16 比该左右侧缘部 5c、5d 还稍稍突出。而且，箱体前部 C5 的下部 C5b 位于比两侧缘部 5c、5d 更靠近内部空间 9 的位置。

在本实施方式中，加强板 10 的一部分被配置在导入口 18 中，从而构成冷却风的引导部 10a，以便使冷却风顺畅地流动并被导入内部空间 9。

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导入口 18 构成第一把持用空间 28，该第一把持用空间 28 为了在搬运发动机发电机 1 时用手把持第一把持部 16 而被使用。而且，导入口 18 形成在第一把持部 16 的下方，进而，主要由里部 23b 形成的导入口 18 的下游部分 18c 成为进入内部空间 9 的空间。从而，该把持用空间 28 的一部分与箱体上部 C4 相比位于下方，并且是进入内部空间 9 的空间。

另一方面，第二把持部 17 与在后盖 6 的上端部 6a 形成的凹部 24 一起形成第二把持用空间 29，该第二把持用空间 29 为了在搬运发动机发电机 1 时用手把持第二把持部 17 而与第一把持用空间 28 一起被使用。凹部 24 位于比第二把持部 17 更靠近内部空间 9 的位置，并且进入内部空间 9，该凹部 24 具有：倾斜部 24a，该倾斜部 24a 从排出口 20 起，越是向上方越是在前后方向上向内部空间 9 倾斜；里部 24b，该里部 24b 从倾斜部 24a 起大体与上下方向平行地向上方延伸。凹部 24 延伸成大体到达第二把持部 17 在横向上的两端部，并且该凹部 24 具有与第二把持部 17 的横宽相比，虽然稍小但大体相等的横宽。

加强板 11 的一部分延伸到与上盖 4 接触的位置，从而构成封闭部 11b，该封闭部 11b 在前后方向上对第二把持用空间 29 在前后方向上靠近内部空间 9 的部分进行大体地封闭。因此，实质上，外部空气不会通过第二把持用空间 29 而作为冷却风导入到内部空间 9。

而且，第一把持部 16 和第二把持部 17 被配置成在箱体 C 中具有垂直于前后方向的作为对称面的平面；凹部 23 和凹部 24、以及第一把持用空间 28 和第二把持用空间 29 被配置成关于该对称面大体面对称。

参照图 1 和图 3，发动机 30 是单气缸、OHC（顶置凸轮轴）型的四冲程空冷发动机，该发动机 30 具有发动机主体 30a，该发动机主体 30a 包括：气缸 31，其与可以往复移动的活塞 35 配合；曲轴箱 32，其结合在气缸 31 的下端部；气缸盖 33，其与气缸 31 一体成形，从而与活塞 35 之间形成燃烧室；以及气缸盖罩 34，其结合在气缸盖 33 的上端部；发动机主体 30a 被固定在下盖 3 上。气缸 31 和曲轴箱 32 支撑曲轴 36，且该曲轴 36 可旋转并被配置成具有平行于前后方向的旋转中心线，该曲轴 36 在活塞 35 的驱动下旋转。

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一并参照图 2 和图 4，发动机 30 具有进气装置 37，该进气装置 37 具有化油器 37b 和进气管 37c，该进气管 37c 与气缸盖 33 连接以便将进气导入到燃烧室。化油器 37b 是一个混合气形成装置，用于形成空气与气体燃料的混合气，所述空气来自空气滤清器 37a，该空气滤清器设有取入口 37a1，用于将从导入口 18 导入到内部空间 9 的冷却风的一部分取入；所述气体燃料是从燃料供给装置 Fa 或外部燃料系统 Fb 供给的。设置在化油器 37b 中的节气门 37b1 由步进电动机 37d 驱动，该步进电动机 37d 由具有微型计算机的 ECU 89 控制，该节气门 37b1 控制发动机 30 的输出，使得曲轴 36 以预先设定的旋转速度旋转。

发动机 30 具有排气装置 38，该排气装置 38 具有：排气管 38a，该排气管 38a 连接在气缸盖 33 上，以便来自燃烧室的废气流入管中；和消声器 38b，该消声器 38b 与排气管 38a 连接。

此外，混合气经过设置在气缸盖 33 上并由气门装置开闭的进气门 39a 而流入燃烧室，该混合气通过保持在支架 44（参照图 3）上的火花塞 42 来点火并燃烧，然后通过产生的燃烧压驱动活塞 35，从而使曲轴 36 被旋转驱动。燃烧气体作为废气，经过由气门装置开闭的排气门 39b 后，通过排气管 38a 流入消声器 38b，由消声器 38b 降低排气音量之后，经过与形成在后盖 6 上的排气口 21 相面对的排气尾管 38c 而排放到外部大气中。

参照图 1 和图 3，被发动机 30 旋转驱动的发电机 40 具有转子 40a 和定子，所述转子 40a 具有磁体，并且该转子 40a 被固定在作为发动机 30 的输出轴的曲轴 36 的轴端部；所述定子具有线圈，并且该定子被配置在转子 40a 的径向内侧并固定在曲轴箱 32 上。具有火花塞 42 的点火装置具有点火线圈 44（参照图 6），由发电机 40 产生的电力对电容器充电后，供给该点火线圈 44 的初级侧；响应于在曲轴 36 的特定的旋转位置产生的点火信号，使点火线圈 44 中产生的高电压施加给火花塞 42。

此外，被曲轴 36 旋转驱动的冷却风扇 45 结合在转子 40a 上而与转子 40a 一体旋转，从而在发动机 30 的运转中，经由导入口 18 将外部空气作为冷却风吸引到箱体 C 内。此外，发动机 30 通过作为起动装置的反冲起动器 46 的动作而被起动。反冲起动器 46 与冷却风扇 45 相连接，从而，

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通过用与反冲起动器 46 的起动绳 46a 相连接的旋钮拉动起动绳 46a 的操作来驱动曲轴 36 旋转。

参照图 2～图 4，为了提高对运转噪声的隔音效果和冷却风的冷却效果，发动机主体 30a 和排气管 38a 被护罩 47 所覆盖，该护罩 47 在发动机主体 30a 和排气管 38a 之间形成冷却风的导风通路。合成树脂制的护罩 47 被固定在发动机主体 30a 上，同时，在与护罩 47 一体成形的托架 47a 中，被固定在上盖 4 上。此外，冷却风扇 45 被结合在护罩 47 前端部的合成树脂制的风扇罩 48 所覆盖；反冲起动器 46 被结合在风扇罩 48 前端部的起动器罩 49 所覆盖。冷却风扇 45 从形成在起动器罩 49 上的流入口 50 及形成在起动器罩 49 与风扇罩 48 之间的流入口 51 吸引内部空间 9 的空气，并将冷却风输送到护罩 47 内。

配置在冷却风扇 45 和反冲起动器 46 的前方以对发电机 40 产生的电力进行控制的电力控制单元 41 具有：变流器 41a，用于控制该电力的电压和频率（参照图 6）；以及散热翼片 41b，其作为散热器，用于散发包括变流器 41a 在内的电气部件所产生的热量。

而且，在箱体 C 的内部空间 9 中，电力控制部件 41、反冲起动器 46、冷却风扇 45、发电机 40、发动机主体 30a 以及消声器 38b 以该顺序，作为整体向后方，也是在从导入口 18 朝向排出口 20 的冷却风的流动方向上，串连配置在曲轴 36 的旋转中心线上。

参照图 1，燃料系统 F 向发动机 30 供给作为燃料的气体燃料，该燃料系统 F 具有：燃料供给装置 Fa，其配置在箱体 C 或箱体 C 的内部空间 9 中，是发动机发电机 1 所具有的内部燃料系统；和外部燃料系统 Fb，其配置在箱体 C 的外部。

参照图 1～图 4，燃料供给装置 Fa 具有盒式高压储气瓶 61 和燃料压力调节器 62，所述盒式高压储气瓶 61 被配置在设于箱体 C 内的作为燃料容器设置部的容纳部 60 中，是单个或多个作为第一燃料源（或主体侧燃料源）的第一燃料容器。在本实施方式中，燃料压力调节器 62 对从两个盒式高压储气瓶 61 和后述的外部高压储气瓶 71 流出的气体燃料的压力进行减压，同时，调节气体燃料的压力，以便向化油器 18b 供给与发动机 30

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的负载相对应的燃料量。燃料供给装置 Fa 还具有：加热装置 80，用于对盒式高压储气瓶 61 和燃料压力调节器 62 进行加热；燃料切换阀 12，其作为燃料切换装置，设置在操作板部 5e 上；燃料配管组，其包括连接器 14，并且在箱体 C 的内部空间 9 中将盒式高压储气瓶 61、燃料压力调节器 62 以及化油器 18b 等相互连接；以及燃料截止阀 63，其使从燃料系统 F 向发动机 30 的气体燃料的供给停止。

在盒式高压储气瓶 61 中，以液化状态储存沸点较高的气体燃料，例如丁烷。此外，通过将盒式高压储气瓶 61 的燃料供给部插入在设于容纳部 60 的连接器 64（参照图 2）中，盒式高压储气瓶 61 就被可装拆地支撑在容纳部 60 中。

外部燃料系统 Fb 具有外部高压储气瓶 71、连接外部高压储气瓶 71 和连接器 14 的配管 A5、以及减压器 72，所述外部高压储气瓶 71 设置在发动机发电机 1 的外部，是作为第二燃料源（或者外部燃料源）的第二燃料容器。在比盒式高压储气瓶 61 具有更大燃料容量（即，所储存的燃料量多）的外部高压储气瓶 71 中，以液化状态储存有比第一气体燃料沸点更低的第二气体燃料，例如丙烷。该外部高压储气瓶 71 例如是家庭用丙烷高压气瓶。

容纳部 60 由形成容纳室 65 的室壁 66 构成，该容纳室 65 用于容纳两个盒式高压储气瓶 61。室壁 66 包括：第一侧壁 66a，其由热的良导体，例如铝等金属构成；第二侧壁 66b，其由右盖 8 的一部分构成；以及底壁 66c，容纳室 66 的上部在内部空间 9 敞开。两个盒式高压储气瓶 61 和容纳部 60 在沿前后方向与电力控制单元 41、燃料压力调节器 62 以及流入口 50、51 重叠的位置上，被设置得靠近右盖 8。配置在盒式高压储气瓶 61 与电力控制单元 41 及燃料压力调节器 62 之间的第一侧壁 66a 被设置成，其上部根据冷却风来讲位于导入口 18 的出口 18b 的下游，并且，位于在上下方向与出口 18b 重叠的位置。而且，第一侧壁 66a 的上端部位于内部空间 9 的大体最上部。此外，盒式高压储气瓶 61、第一侧壁 66a、燃料压力调节器 62 以及电力控制单元 41 位于在左右方向上与出口 18b 重叠的位置。

在第一、第二侧壁 66a、66b 上，为了防止或抑制由发动机 30 的运转

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引起的振动传递到盒式高压储气瓶 61 上而导致盒式高压储气瓶 61 振动，设置由弹性材料构成的作为防振部件的支撑体 67，使其与盒式高压储气瓶 61 的外周面接触。

在容纳部 60 中设置有安装传感器 68，该安装传感器 68 用于检测盒式高压储气瓶 61 的有无或安装状态。安装传感器 68 被安装在设于容纳室 65 外部的安装部件 69 上，并贯通第一侧壁 66a 而位于容纳室 65 内。安装传感器 68 例如由具有接触片 68a 的微动开关构成，其通过使接触片 68a 接触盒式高压储气瓶 61 来检测盒式高压储气瓶 61 已被正确地安装。

各盒式高压储气瓶 61 接近电力控制单元 41 来进行配置，以便能够与电力控制单元 41 进行热交换。更具体地讲，盒式高压储气瓶 61 通过由热的良导体，例如铝等金属构成的传热部件 70 来与第一侧壁 66a 进行热连接。多个是柱状部件的传热部件 70 在其一端部接触盒式高压储气瓶 61，在另一端部接触第一侧壁 66a。而且，第一侧壁 66a 以邻接的状态与电力控制单元 41 接近配置，以便通过在内部空间 9 中的经由冷却风的热传导能够与电力控制单元 41 进行热交换。因此，各盒式高压储气瓶 61 被配置成经由用传热部件 70 热连接的第一侧壁 66a 能够进行与电力控制单元 41 的热交换。

以液化状态向燃料压力调节器 62 供给来自盒式高压储气瓶 61 的第一气体燃料，并且以气体状态向燃料压力调节器 62 供给来自外部高压储气瓶 71 的第二气体燃料，该燃料调压器 62 被配置在电力控制单元 41 和流入口 50、51 的正上方，并与两个盒式高压储气瓶 61、容纳部 60 的第一侧壁 66a、电力控制单元 41 以及流入口 50、51 在前后方向上重叠。而且，燃料压力调节器 62 以与电力控制单元 41 邻接的状态而接近配置，以便通过在内部空间 9 中的经由冷却风的热传导能够与电力控制单元 41 进行热交换。（在图 4 中，为了方便，燃料压力调节器 62 用双点划线表示。）进而，燃料压力调节器 62 具有使以液化状态流入的第一气体燃料气化的作为蒸发器的功能。

参照图 1，在燃料供给装置 Fa 中，由两个盒式高压储气瓶 61、连接两个盒式高压储气瓶 61 和燃料切换阀 12 的配管 A1、连接燃料切换阀 12 和燃料压力调节器 62 的配管 A2、燃料压力调节器 62、连接燃料压力调节

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器 62 和化油器 18b 的配管 A3、以及设置在配管 A3 上的燃料截止阀 63 构成从盒式高压储气瓶 61 向发动机 30 供给第一气体燃料的第一燃料系统；此外，由连接连接器 14 和燃料切换阀 12 的配管 A4、连接燃料切换阀 12 和燃料压力调节器 62 的配管 A2、燃料压力调节器 62、连接燃料压力调节器 62 和化油器 18b 的配管 A3、以及燃料截止阀 63 构成从外部高压储气瓶 71 向发动机 30 供给第二气体燃料的第二燃料系统。

因此，箱体 C 内的配管 A1～A4 构成燃料配管组。此外，燃料压力调节器 62、配管 A3 以及燃料截止阀 63 在第一、第二燃料系统中是公共的公共燃料系统。

作为燃料切断装置的燃料截止阀 63，例如由在没有驱动电流被供给时为开阀状态的常开电磁阀构成，其根据第一气体燃料的压力由 ECU 89 进行开闭控制。更具体地讲，为了检测来自盒式高压储气瓶 61 的压力，在燃料压力调节器 62 上设置燃料压力传感器 73，该燃料压力传感器 73 用于检测从盒式高压储气瓶 61 到达燃料压力调节器 62 的第一气体燃料的压力。然后，当由燃料压力传感器 73 检测出压力超过上限压力 P1 的压力时，ECU 89 使燃料截止阀 63 闭阀以切断公共燃料系统。该上限压力 P1 是根据如下观点预先设定的，该观点是，在盒式高压储气瓶 61 处于过热状态时等，盒式高压储气瓶 61 内的第一燃料气体的压力成为过大的状态下，避免发动机 30 的运转，从而安全地使用发动机发电机 1。

燃料切换阀 12 将供给发动机 30 的气体燃料在通过第一燃料系统供给的第一气体燃料和通过第二燃料系统供给的第二气体燃料之间进行切换。燃料切换阀 12 可以在以下位置间进行操作：第一位置，燃料切换阀 12 在该位置将第一燃料系统与发动机 30 连接起来，以便将第一气体燃料供给发动机 30（在图 5 中，是“盒式”的位置，用单点划线表示。）；第二位置，燃料切换阀 12 在该位置将第二燃料系统与发动机 30 连接起来，以便将第二气体燃料供给发动机 30（在图 5 中，是“外部”的位置，用双点划线表示。）；停止位置，燃料切换阀 12 在该位置切断第一燃料系统和第二燃料系统与发动机 30，从而停止向发动机 30 供给气体燃料（在图 5 中，是“关断”的位置，用实线表示。），并且，第一位置与第二位置之间的切换总是

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经过停止位置而进行。

一并参照图 6，此外，燃料切换阀 12 进行第一气体燃料与第二气体燃料间的燃料的切换，同时，还兼用作控制发动机 30 的运转和停止的发动机运转开关、和控制点火装置及加热装置 80 的动作和非动作的控制开关。因此，燃料切换阀 12 根据其操作位置对控制点火装置的动作和非动作的断流开关 74 进行开闭，并对控制加热装置 80 的动作和非动作的主开关 75 进行开闭。

加热装置 80 具有：电加热器 81a、81b，其作为加热源，对应每个盒式高压储气瓶 61 而设置在容纳部 60 中；电加热器 82，其作为加热源，设置在燃料压力调节器 62 中；温度传感器 83a、83b、84，其分别检测各盒式高压储气瓶 61 的温度和燃料压力调节器 62 的温度；温度传感器 85a、85b、86，其分别检测电加热器 81a、81b、82 的温度；继电器 87a、87b、88，其根据由温度传感器 83a、83b、84 和温度传感器 85a、85b、86 所检测出的温度，根据 ECU 89 的指令，开闭电加热器 81a、81b、82 的加热电路；指示灯 15a、15b（也参照图 5），其显示电加热器 81a、81b 的动作状态。

电加热器 81a、81b、82 分别加热两个盒式高压储气瓶 61 和燃料压力调节器 62，以促进液化状态的第一气体燃料的气化。由此，能够防止由第一气体燃料气化等引起的盒式高压储气瓶 61 和燃料压力调节器 62 的温度的过度降低，从而防止第一气体燃料的压力的过度降低，使得第一气体燃料稳定地供给发动机 30。

一并参照图 7，当燃料切换阀 12 位于第一位置或第二位置时，处于能够向发动机 30 供给第一气体燃料或第二气体燃料的状态，而且，从断流开关 74 断开时起，点火装置就处于可动作状态，发动机 30 处于可运转状态。（即，燃料切换阀 12 作为发动机运转开关，成为接通状态。）此外，当燃料切换阀 12 处于停止位置时，则停止向发动机 30 供给第一气体燃料或第二气体燃料，而且，从断流开关 74 闭合时起，点火装置就处于非动作状态，发动机 30 停止。（即，燃料切换阀 12 作为发动机运转开关，成为关断状态。）

另一方面，加热装置 80 只在燃料切换阀 12 位于第一位置时，由于主

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开关 75 闭合而成为可动作状态，于是，通过对盒式高压储气瓶 61 和燃料压力调节器 62 进行加热的各电加热器 81a、81b、82，根据盒式高压储气瓶 61 和燃料压力调节器 62 的温度来进行加热控制。此外，当燃料切换阀 12 位于第二位置和停止位置时，由于第一气体燃料不供给发动机 30，所以，主开关 75 断开，从而加热装置 80 成为非动作状态，于是盒式高压储气瓶 61 和燃料压力调节器 62 的加热被停止。

下面，对如上构成的实施方式的作用和效果进行说明。

将燃料切换阀 12 从停止位置操作到第一位置，从而第一气体燃料处于可供给发动机 30 的状态，在该状态下，操作反冲起动机 46，从而发动机 30 起动，然后开始自力运转。然后，由发动机 30 驱动的发电机 40 所产生的电力被电力控制单元 41 控制，并被供给到插座 13 上所连接的电气设备。同时，由发动机 30 驱动的冷却风扇 45 通过流入口 50、51 吸引内部空间 9 的空气。通过该冷却风扇 45 的吸引作用，外气通过导入口 18 而被作为冷却风导入到内部空间 9。

来自导入口 18 的冷却风从内部空间 9 的最上部流入内部空间 9，其一部分通过热传导与第一侧壁 66a 和燃料压力调节器 62 进行了热交换后，流到下方以冷却电力控制 41b，进而，在与第一侧壁 66a 和燃料压力调节器 62 进行了热交换后，通过流入口 50、51 而被冷却风扇 45 吸引。然后，冷却风被冷却风扇 45 输送到护罩 47 内，在护罩 47 内对发动机主体 30a 和排气管 38a 进行了冷却后，冷却消声器 38b，并从排出口 20 被排放到外部。

当通过发动机 30 的运转，盒式高压储气瓶 61 的第一气体燃料的剩余量变得很少等，从而需要切换到外部高压储气瓶 71 的第二气体燃料时，将燃料切换阀 12 临时操作到停止位置，从而发动机 30 被停止。此时，通过断流开关 74 的动作能够使发动机 30 快速地停止。接着，将燃料切换阀 12 操作到第二位置。由此，第二气体燃料成为可供给发动机 30 的状态，然后通过反冲起动机 46 的操作使发动机 30 起动。

此处，在发动机发电机 1 的前盖 5 上形成有凹部 23，该凹部 23 位于比第一把持部 16 更靠近内部空间 9 的位置，第一把持部 16 和凹部 23 共同形成导入口 18，导入口 18 构成第一把持用空间 28，进而，在后盖 6 上

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形成有凹部 24，该凹部 24 位于比第二把持部 17 更靠近内部空间 9 的位置，第二把持部 17 和凹部 24 共同构成第二把持用空间 29。

从而，由于冷却风的导入口 18 还兼用作把持用空间 28，所以第一把持用空间 28 被形成为形成内部空间 9 的前盖 5 本身，而且，由于形成第一、第二把持用空间 28、29 的一方的部分就是进入箱体 C 的内部空间 9 的凹部 23、24，所以，与将整个把持用空间形成在发动机发电机的箱体外部的情况相比，能够防止或抑制第一、第二把持部 16、17 从箱体 C 的前盖 5 和后盖 6 突出，从而第一、第二把持部 16、17 并不占用特别大的空间，因此能够使发动机发电机 1 小型化，使保管空间小。而且，由于第一、第二把持部 16、17 的存在不明显，所以第一、第二把持部 16、17 很少使发动机发电机 1 的美观受损，从而能够提高发动机发电机 1 的外观性。再者，由于冷却风的导入口 18 还兼用作第一把持用空间 28，所以不必分别设置导入口 18 和第一把持用空间 28，因此，与将把持用空间与导入口分开设置的情况相比，能够减少对箱体 C 的外观设计的制约。另外，由于第一、第二把持用空间 28、29 位于作为箱体侧部的前盖 5 和后盖 6 上，所以使发动机发电机的搬运变得容易。

此外，在发动机 30 的运转中，由于第一把持部 16 被通过导入口 18 的冷却风吹拂而冷却，所以在把持第一、第二把持部 16、17 以搬运运转中的发动机发电机 1 时，把持部不会被过分加热，从而在发动机发电机 1 的运转过程中也能够会把持部 16、17 进行把持。

第一、第二把持部 16、17 具有向下方延伸的下垂部 16b、17b，以便能够从外侧部分 16b1、17b1 经由最下端 16b2、17b2 直到内侧部分 16b3、17b3 进行握持，从而能够握住下垂部 16b、17b，因此，第一、第二把持部 16、17 的把持变得容易，从而发动机发电机 1 的搬运变得容易。

此外，通过利用具有下垂部 16b 的第一把持部 16 和凹部 23，使导入口 18 形成迷宫状的通路，因此不会因使导入口 18 成为迷宫状而使结构复杂化。而且，由于内部空间 9 通过迷宫状的导入口 18 连通到外部，所以能够能够大幅降低运转噪声的泄漏量。其结果是，不使成本增加就能够减轻通过导入口 18 泄漏到外部的运转噪声。

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第一把持部 16 设置在箱体前部 C5 上；导入口 18 的入口 18a 形成在第一把持部 16 的下方；第一把持部 16 和导入口 18 被设置为到达箱体前部 C5 在横向上的两端部。从而，由于在横向上把持第一把持部 16 的位置的自由度增大，所以能够选择易于把持的位置，以使发动机发电机 1 的搬运变得容易。此外，不损害外观上的美观性就能够加大导入口 18 中的冷却风的吸气面积，而且，通过跨过横向宽范围而流入内部空间 9 的冷却风能够抑制空气在内部空间 9 中的滞留，因此能够提高发动机 30、发电机 40 和电力控制单元 41 的冷却效果。

通过使导入口 18 设置在前盖 5 的上部，当发动机刚停止后处于热浸（hot soak）时，发动机 30、发电机 40 和电力控制单元 41 周围的热气通过对流而上升到内部空间 9 的上部。因此，热气易于从导入口 18 流出，从而促进箱体 C 的内部空间 9 的自然换气，由此能够促进发动机刚停止后的发动机 30、发电机 40 和电力控制单元 41 的冷却。

在前盖 5 中，左右侧缘部 5c、5d 比操作板部 5e 向前方突出，第一把持部 16 比该左右侧缘部 5c、5d 还稍稍突出，而且，箱体前部 C5 的下部 C5b 位于比两侧缘部 5c、5d 更靠近内部空间 9 的位置。因此，发动机发电机 1 即使以前盖 5 接触墙壁等的外部部件的状态被放置时，也由于在左右侧缘部 5c、5d 之间，向下方敞开的空间和下垂部 16b、17b 比两侧缘 5c、5d 突出而在侧缘部 5c、5d 与上述外部部件之间形成间隙，所以能够将充分量的外部空气作为冷却风导入至导入口 18 中。

盒式高压储气瓶 61 和燃料压力调节器 62 被配置成接近电力控制单元 41，以便与电力控制单元 41 进行热交换。因此，在发动机发电机 1 的运转中，由于燃料的气化等而变成低温的盒式高压储气瓶 61 和燃料压力调节器 62 通过经由冷却风的热传递能够与电力控制单元 41 进行热交换。因此，从电力控制单元 41 的散热量增加，换言之，通过盒式高压储气瓶 61 和燃料压力调节器 62 来促进电力控制单元 41 的冷却，以抑制电力控制单元 41 的温度上升。同时，盒式高压储气瓶 61 和燃料压力调节器 62 被电力控制单元 41 加热，以抑制其温度降低。其结果是，在盒式高压储气瓶 61 及燃料压力调节器 62 与电力控制单元 41 之间，通过相互利用彼此的热量，能够

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抑制电力控制单元 41 的温度上升，因此能够使作为电力控制单元 41 的散热结构的散热翼片 41b 小型化。此外，由于抑制了盒式高压储气瓶 61 和燃料压力调节器 62 的温度降低，所以能够使加热装置 80 的加热量减少，从而能够使作为加热源的电加热器 81a、81b、82 的消耗电力减少。

盒式高压储气瓶 61 与形成容纳室 65 的第一侧壁 66a 通过传热部件 70 热连接；第一侧壁 66a 接近电力控制单元 41 而配置，以便能够与电力控制单元 41 进行热交换，从而盒式高压储气瓶 61 中的从电力控制单元 41 的受热，以及电力控制单元 41 的散热都通过传递盒式高压储气瓶 61 的热量的第一侧壁 66a 进行。因此，由于在盒式高压储气瓶 61 与电力控制单元 41 之间进行热交换，所以能够减小对盒式高压储气瓶 61 和电力控制单元 41 的配置的制约。此外，通过加大第一侧壁 66a、或者使第一侧壁 66a 与电力控制单元 41 更加接近等的第一侧壁 66a 的形状或配置，能够使盒式高压储气瓶 61 与电力控制单元 41 之间的传热量增加，从而能够提高盒式高压储气瓶 61 与电力控制单元 41 之间的相互的热量的利用率。其结果是，能够在通过第一侧壁 66a 而相互利用盒式高压储气瓶 61 和电力控制单元 41 之间的热量的基础上，加大盒式高压储气瓶 61 和电力控制单元 41 的配置的自由度，此外能够提高盒式高压储气瓶 61 和电力控制单元 41 的相互的热量的利用率，从而能够更加高效地进行盒式高压储气瓶 61 对电力控制单元 41 的冷却，以及电力控制单元 41 对盒式高压储气瓶 61 的加热。

经过导入口 18 被导入内部空间 9 的冷却风的至少一部分通过第一侧壁 66a 依次冷却了盒式高压储气瓶 61、燃料压力调节器 62 以及电力控制单元 41 后，对发电机 40 和发动机 30 进行冷却，从而，被导入内部空间 9 的冷却风被盒式高压储气瓶 61 和燃料压力调节器 62 冷却为更低的温度，该成为低温的冷却风首先冷却电力控制单元 41，然后冷却发电机 40 和发动机 30。因此，能够更加有效地冷却电力控制单元 41，并且发电机 40 和发动机 30 也能够得到更高的冷却效果。

由于变流器 41a 的切换损失大，发热量大，所以，由于其动作而成为高温的变流器 41a 被盒式高压储气瓶 61 和燃料压力调节器 62 有效地冷却，从而抑制了变流器 41a 的升温；盒式高压储气瓶 61 和燃料压力调节器 62

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被高温的变流器 41a 有效地加热，从而抑制了其温度降低。其结果是，发热量大的变流器 41a 被有效地冷却，且盒式高压储气瓶 61 和燃料压力调节器 62 被变流器 41a 有效地加热。

燃料压力调节器 62 在上下方向和左右方向上处于与导入口 18 重叠的位置，并且配置在电力控制单元 41 的正上方，从而，从导入口 18 流入内部空间 9 的冷却风由于燃料压力调节器 62 而朝向电力控制单元 41 偏转方向，因此，通过从导入口 18 刚流入内部空间 9 的冷却风，能够进一步促进电力控制单元 41 的冷却。

流入口 50、51 在前后方向上位于与第一侧壁 66a 和燃料压力调节器 62 重叠的位置，从而，通过与第一侧壁 66a 和燃料压力调节器 62 的热交换而被冷却了的冷却风从流入口 50、51 流入，因此，促进了发动机主体 30a 和消声器 38b 的冷却。

下面，参照图 8、图 9 对本发明的第二实施方式进行说明。该第二实施方式在第二把持部 17 形成冷却风的导入口这一点上与第一实施方式不同，其它基本具有相同的结构。因此，对相同部分的说明加以省略或简化，以不同点为中心进行说明。并且，对与第一实施方式的部件相同的部件或对应的部件，根据需要使用了相同的标号。

第二把持部 17 与凹部 24 共同形成作为第二导入口的导入口 19。在下垂部 17b 的最下端 17b2 与倾斜部 24a 之间，形成朝向后方并与后方平行敞开的导入口 19 的入口 19a；在第二把持部 17 的上部 17a 与里部 24b 的上端部之间形成导入口 19 的出口 19b。此外，入口 19a 形成在第二把持部 17 的下方，导入口 19 被设置为大体到达箱体后部 C6 在横向上的两端部 C6c、C6d。导入口 19 的横宽与作为第一导入口的导入口 18 的横宽相等，进而与后盖 6 的横宽大体相等。

因此，从入口 19a 流入的冷却风沿前后方向朝内部空间 9 流动后，沿下垂部 17b 的内侧部分 17b3 和里部 24b 偏向上方流动，进而，通过上部 17a 而沿前后方向朝内部空间 9 偏转方向后，从出口 19b 流出到内部空间 9 中。这样，第二把持部 17 与凹部 24 形成使第二导入口 19 在多个部位弯曲的迷宫状的通路。

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此外，加强板 11 的一部分配置在导入口 19 中，从而构成冷却风的引导部 11a，以使冷却风顺畅地流动并被导入内部空间 9。

而且，导入口 19 构成第二把持用空间 29，该第二把持用空间 29 在搬运发动机发电机 1 时，为了用手把持第二把持部 17 而被使用。导入口 19 形成在第二把持部 17 的下方，并且，主要由里部 24b 形成的导入口 19 的下游部分 19c 进一步成为进入内部空间 9 的空间，因此，第二把持用空间 29 的一部分是比箱体上部 C4 位于下方，并且进入内部空间 9 的空间。

根据该第二实施方式，除了能够达到与第一实施方式相同的效果外，还能够达到如下的作用和效果。

即，第一、第二把持部 16、17 分别设置于在箱体 C 中隔着发电机 40 和发动机 30 而相对的前盖 5 和后盖 6 上，第一、第二把持部 16、17 与前盖 5 的凹部 23 及后盖 6 的凹部 24 共同分别形成一对导入口 18、19，从而，冷却风从两侧夹持发动机 30 和发电机 40 而流入内部空间 9 内，因此，与只有一个导入口的情况相比，由于刚流入内部空间 9 后的较低温度的冷却风流过发动机 30 和发电机 40 的周围，所以能够促进发动机 30 和发电机 40 的冷却。此外，在发动机刚停止后处于热浸时等，由于发动机 30、发电机 40 以及电力控制单元 41 周围的热气通过对流而上升到内部空间 9 的上部，所以，易于从分别位于箱体前部 C5 和箱体后部 C6 的上部 C5a、C6a 的两导入口 18、19 流出到外部，而且，与导入口只有一个的情况相比，更易于流出，从而能够进一步促进箱体 C 的内部空间 9 的自然换气。其结果是，通过来自一对导入口 18、19 的冷却风，能够提高发动机 30、发电机 40 以及电力控制单元 41 的冷却效果，而且能够促进发动机刚停止后的发动机 30、发电机 40 和电力控制单元 41 的冷却。

两导入口 18、19 在电力控制单元 41、发电机 40、发动机主体 30a 和消声器 38b 串行排列的方向上相对设置，从而，来自靠近电力控制单元 41 的导入口 18 的冷却风，与第一实施方式相同，顺次冷却电力控制单元 41、发电机 40、发动机主体 30a 和消声器 38b；另一方面，来自靠近发动机 30 的导入口 19 的冷却风的大部分流过护罩 47 的周围而从流入口 50、51 被冷却风扇 45 吸引后，被输送到护罩 47 内，以顺次冷却发电机 40、发动机

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主体 30a 和消声器 38b。其结果是，由于发电机 40 和发动机 30 通过几乎没有被电力控制单元 41 加热的冷却风来进行冷却，所以能够提高发电机 40、发动机主体 30a 和消声器 38b 的冷却效果。

以下，针对变更上述实施方式的一部分结构后的实施方式，对其变更后的结构进行说明。

第一把持用空间 28 并不是如上述实施方式那样，基本上只由导入口 18 构成，如图 10 所示，也可以由内部空间 9 的一部分和第一导入口 92 来构成第一把持用空间 93。更具体地讲，第一把持部 90 与前盖 5 的凹部 91 共同形成第一导入口 92，同时，与构成前盖 5 或箱体 C 的其它盖 4 等同样地，也形成内部空间 9。即，作为用手把持的部分的下垂部 90b 的内侧部分 90b1 形成内部空间 9。此时，由第二把持部和后盖形成的第二把持用空间既可以与第一实施方式同样地被封闭，也可以与第一把持用空间 93 同样地，由内部空间 9 的一部分、和由第二把持部及后盖的凹部共同形成的第二导入口来构成。此外，在图 10 中，如双点划线例示的那样，也可以不在前盖 5 和后盖上分别形成用于形成第一导入口和第二导入口的凹部。

如果这样，由于冷却风的导入口 92 兼用作第一把持用空间 93，所以，第一把持用空间 93 被形成为形成内部空间 9 的前盖 5 本身，进而，将箱体 C 的内部空间 9 作为第一把持用空间 93 的一部分来利用，因此，与将把持用空间的整体形成在箱体 C 的外部的情况相比，能够防止或抑制第一把持部 90 从箱体 C 的前盖 5 突出。其结果是，以发动机发电机 1 的小型化和保管空间的缩小这点为首，在减少对箱体 C 的外观设计的制约等方面上，也与第一实施方式起到同样的效果。

在上述实施方式中，箱体 C 主要由 6 个盖构成，但也可以由 6 个以外的数量的盖构成。

第一、第二把持部 16、17 和导入口 18、19、92 也可以在箱体前部 C5 或箱体后部 C6 中设置在上端部以外的上部、下部、或设置在上下方向的上部与下部的中间部，此外也可以设置在箱体上部 C4 中。导入口 18、19、92 也可以以形成第一、第二把持用空间 28、29、93 为前提，沿横向被分割为多个。

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在上述实施方式中，第一、第二把持部由把持部形成部件的整体构成，但各把持部也可以将构成箱体 C 的箱体结构部件，例如前盖 5、后盖 6 或上盖 4 作为把持部形成部件，来一体地成型为把持部形成部件，并由其一部分构成，或者由与上述箱体结构部件不同的其它部件来构成，并一体地结合在该箱体结构部件上。第一、第二把持部也可以是能用手按住的形状。

盒式高压储气瓶 61、室壁 66 或燃料压力调节器 62 中的至少一个也可以通过由热的良导体构成的传热部件，或者直接地热连接到电力控制单元 41 的散热翼片 41b 上。从而，由于盒式高压储气瓶 61 和燃料压力调节器 62 中的至少一方与电力控制单元 41 之间的传热是通过传热部件利用热传导而进行，所以能够进一步提高相互的热量利用率。其结果是，由于盒式高压储气瓶 61 和燃料压力调节器 62 中的至少一方与电力控制单元 41 之间的相互的热量利用率进一步提高，所以，由盒式高压储气瓶 61 和燃料压力调节器 62 中的至少一方对电力控制单元 41 的冷却效果、以及由电力控制单元 41 对盒式高压储气瓶 61 和燃料压力调节器 62 中的至少一方的加热效果进一步提高。

盒式高压储气瓶 61 和燃料压力调节器 62 中的任何一个也可以对应电力控制单元 41 以能够与电力控制单元 41 进行热交换的方式进行配置。

用于配置盒式高压储气瓶 61 的燃料配置部也可以不必由容纳部 60 构成，因此，在与电力控制单元 41 之间也可以不设置室壁 66。

第一气体燃料也可以以气化状态供给燃料压力调节器 62。第 2 气体燃料也可以是丙烷以外的气体燃料，例如也可以是城市煤气，此外，第二燃料源也可以是供给第二气体燃料的管道。

加热装置 80 的加热源也可以是电加热器以外的热源，例如，也可以利用发动机废气的热等，发动机的余热。此外，由于在盒式高压储气瓶 61 及燃料压力调节器 62 与电力控制单元 41 之间相互利用彼此的热，所以通过电力控制单元 41 的热量抑制盒式高压储气瓶 61 和燃料压力调节器 62 的降温，因此能够利用较低温度的加热源等，从而增加了加热源的选择项，甚至不需要对盒式高压储气瓶 61 或燃料压力调节器 62 加热的加热装置。

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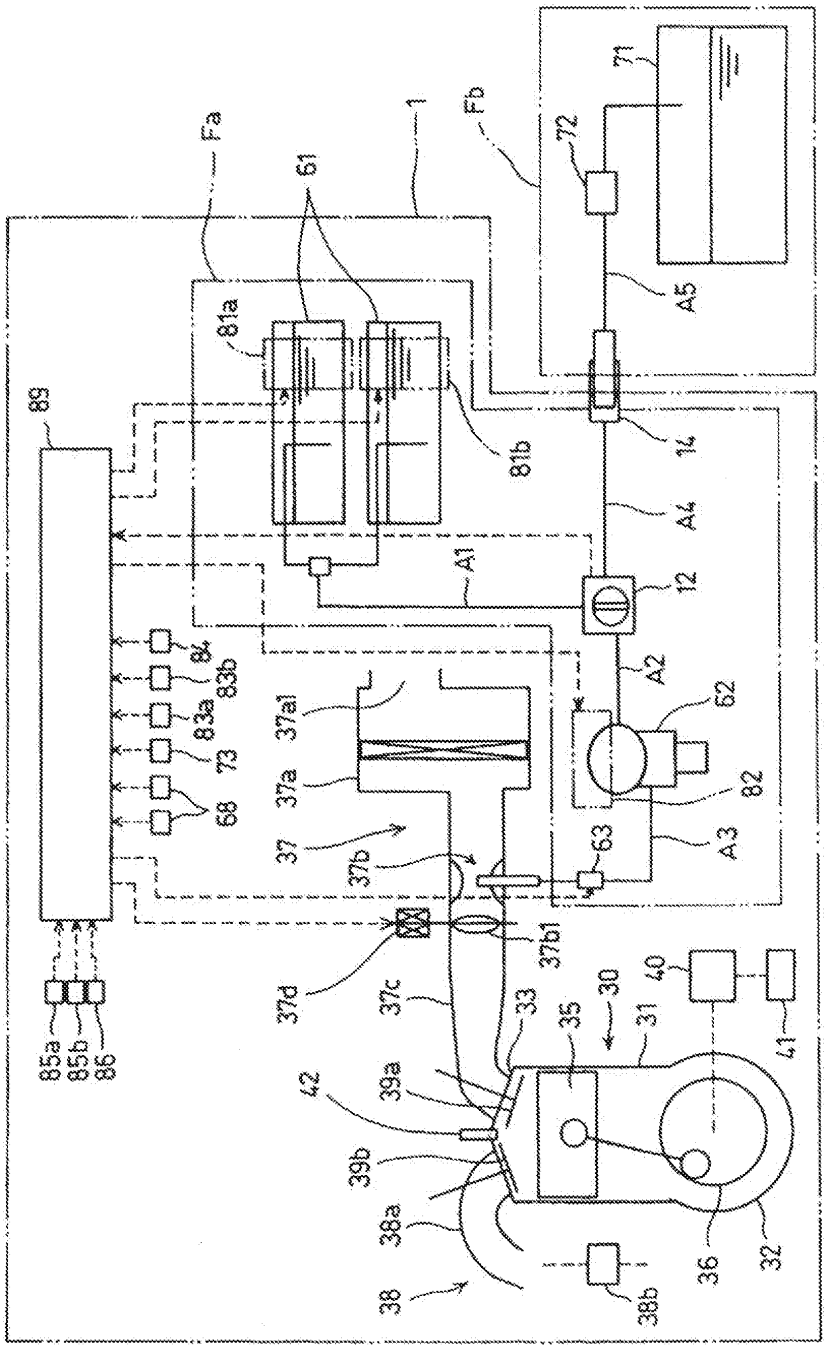


图 1

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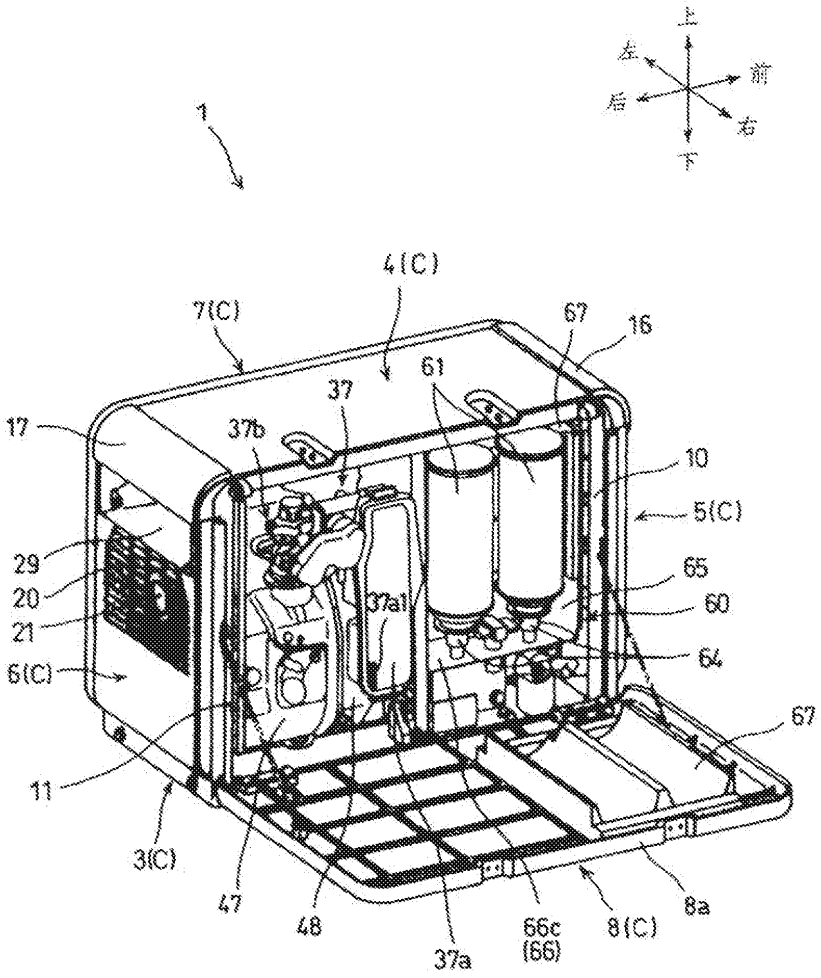


图 2

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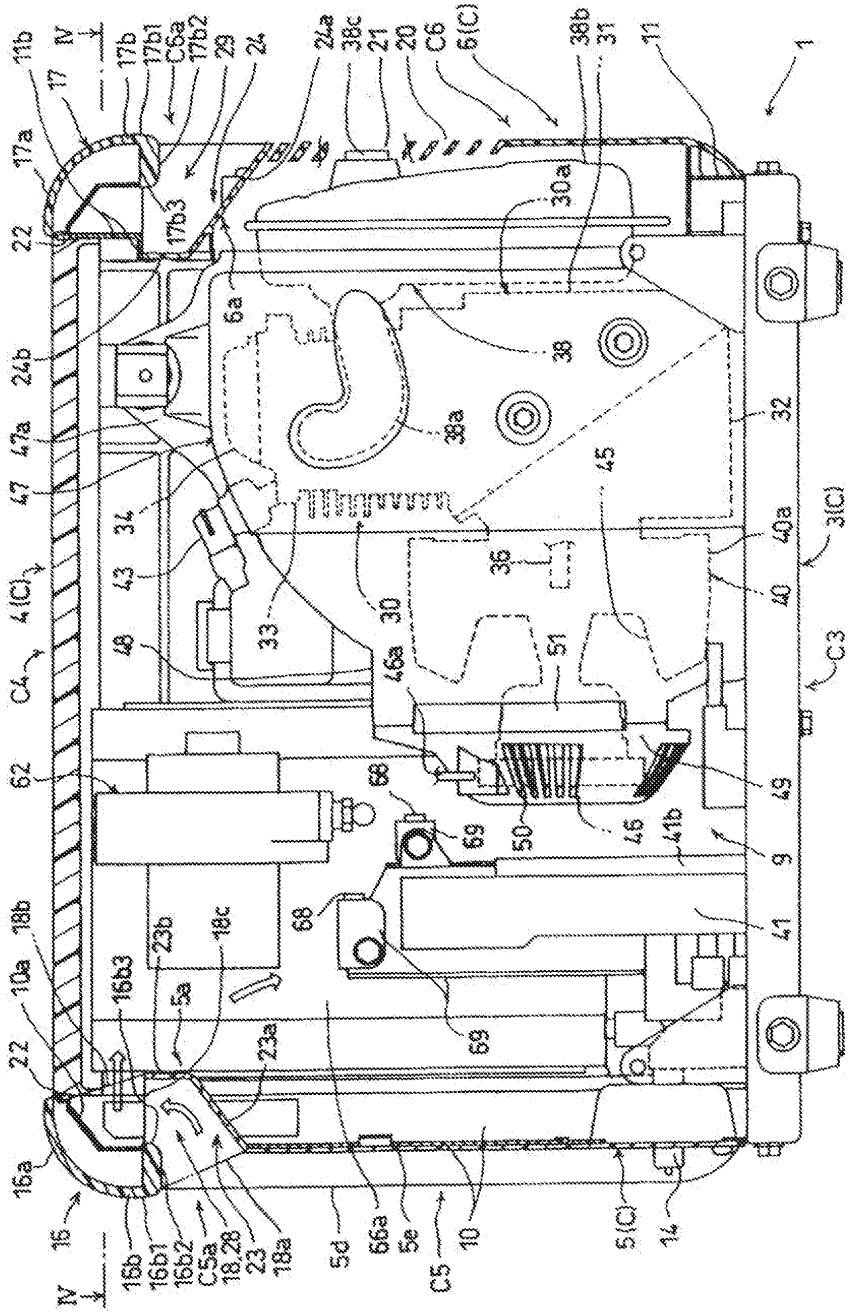


图 3

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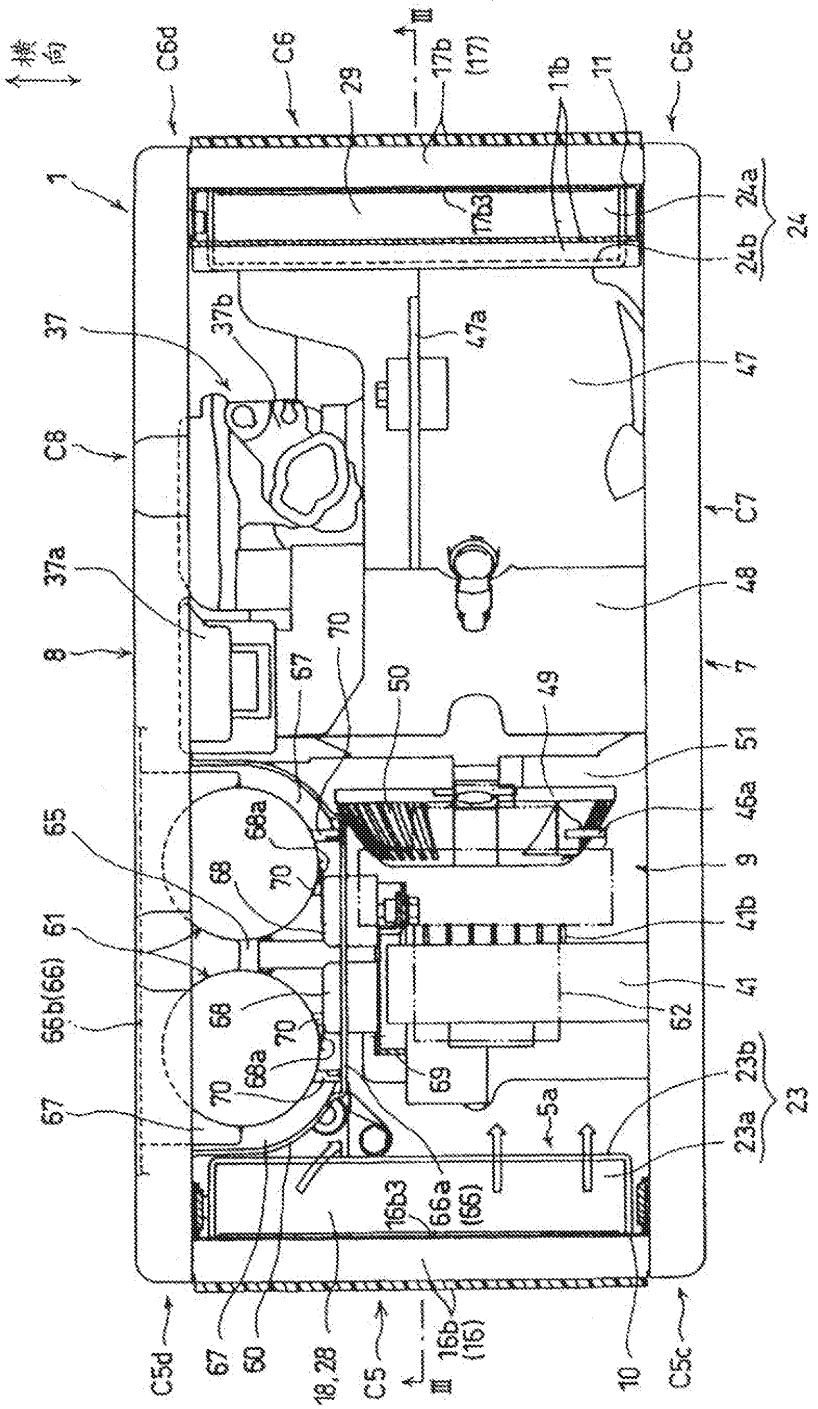


图 4

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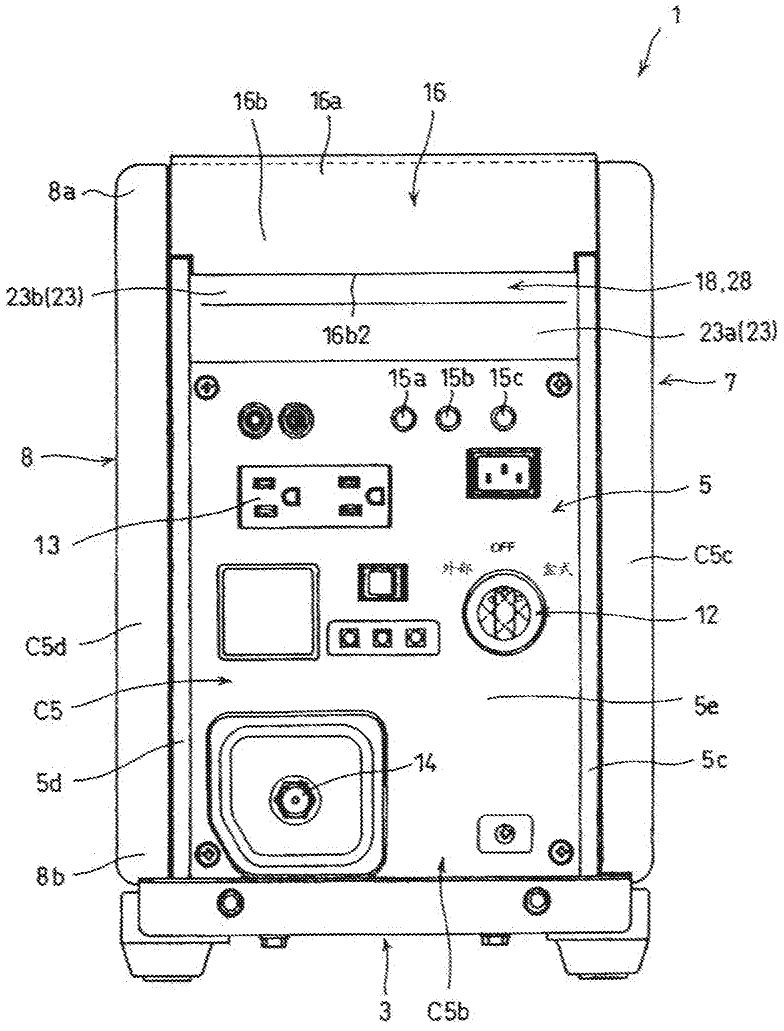


图 5

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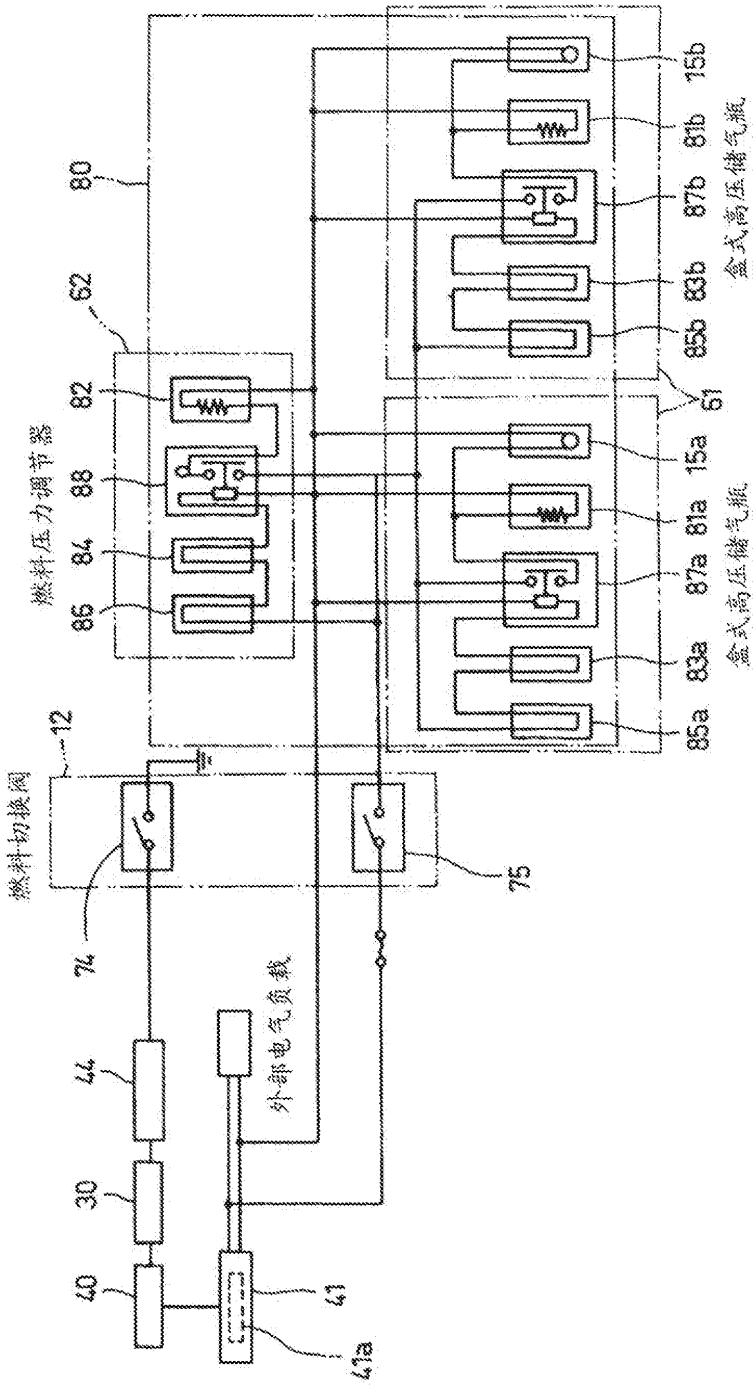


图 6

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	燃料切换阀		
	第 1 位置	停止位置	第 2 位置
向发动机的气体燃料供给状态	盒式高压储气瓶的气体燃料（丁烷）的供给	供给停止	外部气体容器的气体燃料（丙烷）的供给
点火装置的动作状态	动作（断流开关断开）	非动作（断流开关接通）	动作（断流开关断开）
加热装置的动作状态	动作（加热器的主开关接通）	非动作（加热器的主开关断开）	非动作（加热器的主开关断开）

图 7

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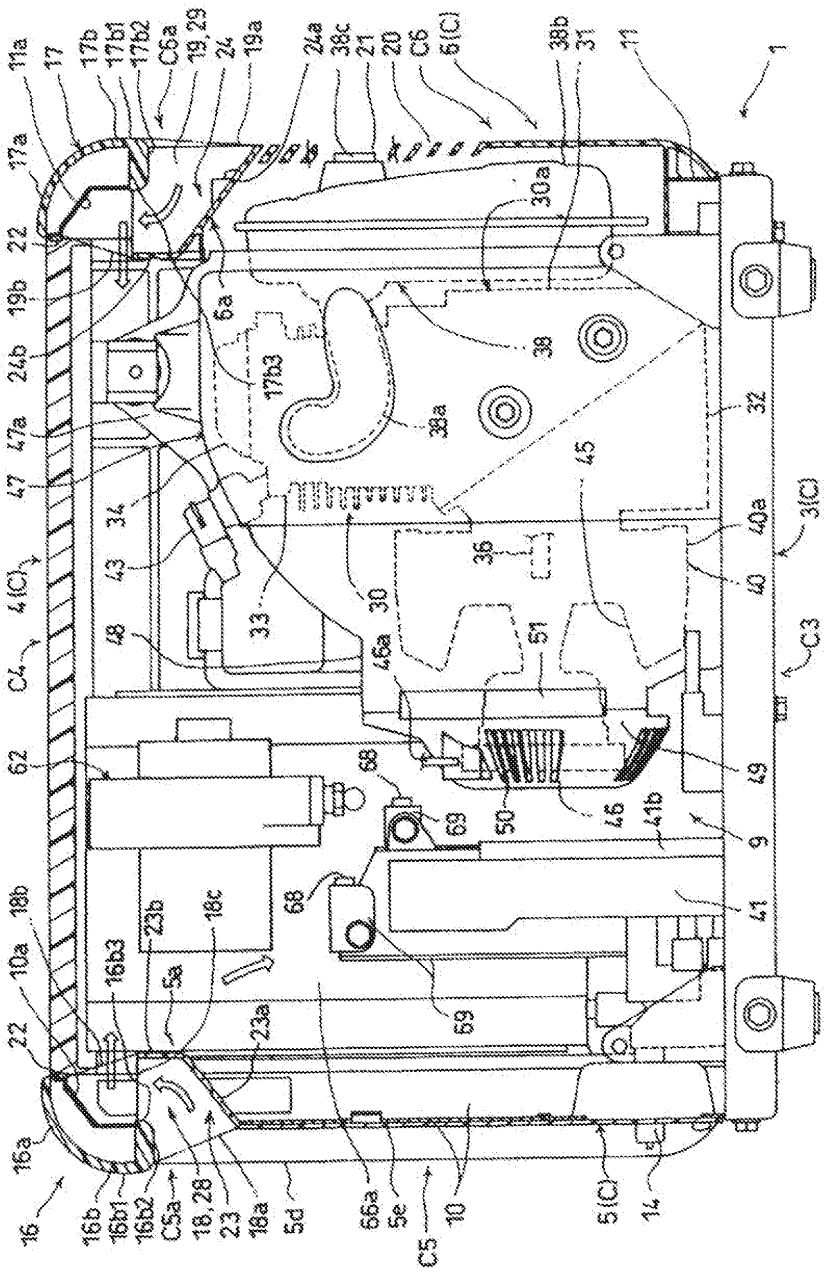


图 8

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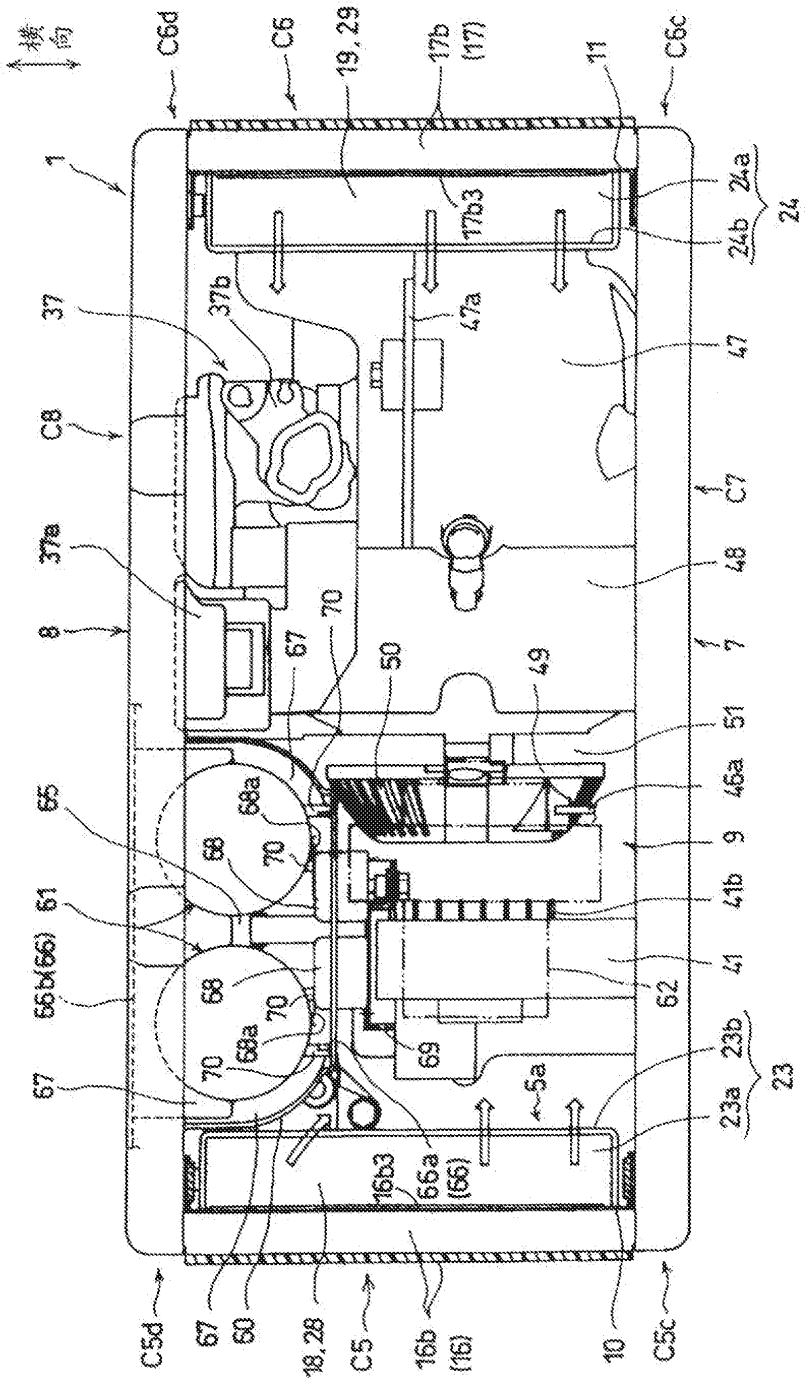


图 9

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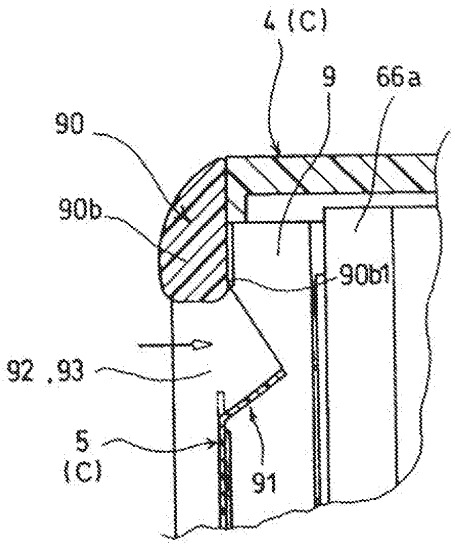


图 10

Exhibit 1003, Page 304
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Electronic Acknowledgement Receipt

EFS ID:	32782612
Application Number:	14738060
International Application Number:	
Confirmation Number:	9670
Title of Invention:	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE
First Named Inventor/Applicant Name:	Mark J. Sarder
Customer Number:	26629
Filer:	Kevin Roger Rosin./Robyn Templin
Filer Authorized By:	Kevin Roger Rosin.
Attorney Docket Number:	CET1090.019
Receipt Date:	01-JUN-2018
Filing Date:	12-JUN-2015
Time Stamp:	14:38:52
Application Type:	Utility under 35 USC 111(a)

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Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	SuppIDS.pdf	1034258 cb455398a06e191d450e5a5b2d27d2f94af273a4	no	4
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2	Transmittal Letter	IDSCertificationStatement.pdf	101310 e9f6cb5fe8bade27a7f1ba7ae8e78b4e042cb9eb	no	1
Warnings:					
Information:					
3	Foreign Reference	FPD1-CN1981121A.pdf	7320128 7958455bc3c299daabda6566d34902d733ecf318	no	40
Warnings:					
Information:					
		Total Files Size (in bytes):	8455696		

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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.
National Stage of an International Application under 35 U.S.C. 371
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.
New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Customer No. 26629 Patent
Confirmation No. 9670 Attorney Docket No. CET1090.019

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	Sarder et al.
Serial No.	:	14/738,060
Filed	:	June 12, 2015
For	:	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE
Group Art No.	:	3747
Examiner	:	Kevin A. Lathers

CERTIFICATION UNDER 37 CFR 1.8(a) and 1.10

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Date: May 15, 2018 /Robyn L. Templin/
Signature

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO OFFICE ACTION MAILED FEBRUARY 22, 2018

Dear Sir:

Responsive to the Office Action mailed February 22, 2018, please consider the following remarks:

In the Claims

1. (Original) A mechanical fuel lockout switch for a dual fuel engine comprising:

a mechanical fuel valve actuateable between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line; and

a fuel lockout apparatus coupled to the mechanical fuel valve;

wherein the mechanical fuel lockout switch:

communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and

communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position.

2. (Original) The mechanical fuel lockout switch for a dual fuel engine of claim 1, wherein the fuel lockout apparatus prevents actuation of the mechanical fuel valve to the first position when the second fuel source communicates with the dual fuel engine.

3. (Original) The mechanical fuel lockout switch for a dual fuel engine of claim 1, wherein the fuel lockout apparatus is configured to:

prevent the second fuel source from coupling to the second fuel line while the mechanical fuel valve is in the first position; and

permit the second fuel source to couple to the second fuel line while the mechanical fuel valve is in the second position.

4. (Original) The mechanical fuel lockout switch for a dual fuel engine of claim 3, wherein the fuel lockout apparatus comprises a flange rigidly coupled to the mechanical fuel valve that covers an inlet of the second fuel line while the mechanical fuel valve is in the first position and uncovers the inlet of the second fuel line while the mechanical fuel valve is in the second position.

5. (Original) The mechanical fuel lockout switch for a dual fuel engine of claim 4, wherein the mechanical fuel valve rotates between the first position and the second position and the flange rotates transversely across the inlet of the second fuel line.

6. (Original) The mechanical fuel lockout switch for a dual fuel engine of claim 4, further comprising;

a first end of a quick-disconnect hose coupling attached to the inlet of the second fuel line; and

a second end of the quick-disconnect hose coupling attached to the second fuel source to mate with the first end of the quick-disconnect hose coupling to couple the second fuel source to the second fuel line.

7. (Original) The mechanical fuel lockout switch for a dual fuel engine of claim 1, wherein the mechanical fuel valve and the fuel lockout apparatus operate together to ensure that fuel from the first fuel source and fuel from the second fuel source are not simultaneously delivered to the dual fuel engine.

8. (Original) The mechanical fuel lockout switch for a dual fuel engine of claim 7, wherein the first fuel source provides liquid fuel from a liquid fuel tank to the dual fuel engine and the second fuel source provides gaseous fuel from a pressurized fuel container to the dual fuel engine.

9. (Original) A dual fuel generator and fuel delivery system comprising:

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;

a fuel regulator system located off board the dual fuel generator, the fuel regulator system comprising:

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

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

a mechanical fuel valve actuateable 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.

10. (Original) The dual fuel generator and fuel delivery system of claim 9 further comprising a fuel lockout apparatus coupled to the mechanical fuel valve; and

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.

11. (Original) The dual fuel generator and fuel delivery system of claim 9, wherein mechanical fuel valve opens and closes the liquid fuel line to selectively control fuel flow from the liquid fuel source to the dual fuel generator; and further comprises:

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.

12. (Original) The dual fuel generator and fuel delivery system of claim 11, 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.

13. (Original) The dual fuel generator and fuel delivery system of claim 11, 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 mechanical fuel lockout switch the inlet of the gaseous fuel line when the mechanical fuel valve closes the liquid fuel line.

14. (Original) The dual fuel generator and fuel delivery system of claim 9, 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.

15. (Original) The dual fuel generator and fuel delivery system of claim 9, further comprising a regulator mounting device secured to the pressurized fuel source with at least the secondary pressure regulator mounted on the regulator mounting device.

16. (Original) The dual fuel generator and fuel delivery system of claim 15, wherein the primary pressure regulator is mounted on the regulator mounting device.

17. (Original) 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 secures to the collar so that the primary and secondary pressure regulators are positioned adjacent each other along an outer periphery of the collar.

18. (Original) The dual fuel generator and fuel delivery system of claim 9, wherein the primary and secondary pressure regulators are integral components of a dual stage pressure regulator.

19. (Original) A method of assembling a mechanical fuel lockout switch for an internal combustion engine comprising:

providing an internal combustion engine configured to operate on a fuel from a first fuel source and a different fuel from a second fuel source;

coupling a mechanical fuel valve to the internal combustion engine actuateable between a first position and a second position to selectively control fuel flow to the internal

combustion engine from the first fuel source through a first fuel line and the second fuel source through a second fuel line; and

coupling a fuel lockout apparatus to the mechanical fuel valve;

wherein when the mechanical fuel valve is in the first position, the fuel lockout apparatus communicates the first fuel source to the internal combustion engine and prevents the second fuel source from coupling to the internal combustion engine, and actuation of the mechanical fuel valve to the second position causes the fuel lockout apparatus to permit the second fuel source to couple to the internal combustion engine, and interrupts the first fuel source communication with the internal combustion engine.

20. (Original) The method of claim 19, wherein the fuel lockout apparatus prevents actuation of the mechanical fuel valve to the first position when the second fuel source is coupled to the internal combustion engine.

21. (Original) The method of claim 20, wherein the fuel lockout apparatus is further configured to:

prevent coupling of the second fuel source to the second fuel line while the mechanical fuel valve is in the first position; and

permit coupling of the second fuel source to the second fuel line while the mechanical fuel valve is in the second position.

22. (Original) The method of claim 19, wherein the fuel lockout apparatus comprises a fuel inlet cover configured to actuate in unison with the mechanical fuel valve to cover a fuel inlet on the internal combustion engine for the second fuel source when the mechanical fuel valve is in the first position and uncover the fuel inlet when the mechanical fuel valve is in the second position.

23. (Original) The method of claim 19, further comprising coupling a fuel regulator system to the second fuel source to reduce fuel pressure therefrom and deliver fuel to the second fuel line at a pressure required for operation of the internal combustion engine.

24. (Original) The method of claim 23, further comprising mounting the fuel regulator system to the second fuel source located off-board the internal combustion engine.

25. (Original) The method of claim 23, further comprising:

coupling one end of a quick-disconnect hose coupling to an inlet on the internal combustion engine for the second fuel source; and

coupling a mating end of the quick-disconnect hose coupling to an outlet of the fuel regulator system.

26. (Original) The method of claim 19, further comprising providing gasoline in a liquid fuel tank as the first fuel source and LPG in a pressurized fuel container as the second fuel source.

REMARKS

Claims 1-26 are pending in the present application. In the Office Action mailed February 22, 2018, the Examiner rejected claims 1 and 7 under 35 U.S.C. §102(a)(1) as being anticipated by Sugimoto et al. (US Pub. 2007/0137591). The Examiner next rejected claims 1, 7, 8, 19, 22, and 26 under 35 U.S.C. §102(a)(1) as being anticipated by Pursifull et al. (US Pub. 2011/0168133). Claims 9, 14-18, and 23-25 were rejected under 35 U.S.C. §103 as being unpatentable over Pursifull et al. in view of Sugimoto et al.

Claims 2-6, 10-13, 20, and 21 were indicated as containing allowable subject matter. Such indication is appreciated.

Rejection under 35 U.S.C. §102(a)(1) as being anticipated by Sugimoto et al.

Claim 1

The Examiner rejected claim 1 under 35 U.S.C. §102(a)(1) as being anticipated by Sugimoto et al. (US Pub. 2007/0137591) – hereinafter "Sugimoto."

Claim 1 calls for a mechanical fuel lockout switch for a dual fuel engine provides for the selection of a desired fuel to operate the engine. The mechanical fuel lockout switch includes a mechanical fuel valve and a fuel lockout apparatus. The mechanical fuel valve actuates between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line. The fuel lockout apparatus couples to the mechanical fuel valve ensuring individual communication of the fuel sources to the engine. The mechanical fuel lockout switch communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position and communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position.

In rejecting claim 1, the Examiner asserted that Sugimoto discloses "a mechanical fuel valve 12 actuatable between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source 61 through a first fuel line A1 and a second fuel source 71 through a second fuel line A5 (Fig. 1, shown lines and valve)" and "a fuel lockout apparatus 63 (a fuel cutoff is coupled via the regulator 62 to the valve 12) coupled to the mechanical fuel valve." *Office Action*, February 22, 2018, p. 3-4. The Examiner further asserted that Sugimoto teaches that "mechanical fuel lockout switch: communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual

fuel engine when the mechanical fuel valve is in the first position, and communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position (Para. [0082], the switch has multiple positions which allow valve 12 connect either of the lines A1 or A4 to line A2 and also activate lockout apparatus 63)." *Id.* at 4.

Applicant respectfully disagrees with the rejection. Specifically, Sugimoto does not anticipate that which is called for in claim 1, as anticipation under pre-AIA 35 U.S.C. §102(a)(2) requires that "[t]he identical invention must be shown [in the reference] in as complete detail as is contained in the ... claim." *MPEP §2131* (citing *Richardson v. Suzuki Motor Co.,* 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)). As will be set forth in detail here below, Sugimoto does not disclose each and every element of claim 1 and thus does not anticipate the claim, as "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *MPEP §2131* (citing *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987)).

Sugimoto discloses an engine operated generator 1 that includes an engine 30 that powers an electric generator 40. *Sugimoto*, ¶¶[0041], [0042]. A fuel system F for supplying the fuel gas to the engine 30 has an internal fuel system Fa (fuel bottles 61) and an external fuel system Fb (external fuel bottle 71) disposed outside the case C of the generator. *Sugimoto*, ¶[0070]. The fuel supply system Fa includes a fuel pressure regulator 62, a fuel system selector valve 12, a connector 14, and a fuel cutoff valve 63. *Sugimoto*, ¶[0071]. The fuel pressure regulator 62 reduces the pressure of the fuel gas supplied from fuel bottles 61 and the external fuel bottle 71 and regulates the pressure of the fuel gas so that the fuel gas may be supplied to a carburetor 18b at fuel supply rate varying in proportion to load on the engine 30. *Sugimoto*, ¶[0071]. The fuel system selector valve 12 is placed on the operating panel 5e and is operated to select a fuel supply line. *Sugimoto*, ¶[0071]. The fuel pipes interconnect the fuel bottles 61, the fuel pressure regulator 62 and the carburetor 18b. The fuel cutoff valve 63 stops the flow of the fuel gas from the fuel system F to the engine 30. *Sugimoto*, ¶[0071].

In the fuel supply system Fa, a first fuel system for supplying the first fuel gas from the fuel bottles 61 to the engine 30 is constituted by the fuel bottles 61, a pipe A1 connecting the fuel bottles 61 to the fuel system selector valve 12, a pipe A2 connecting the fuel system selector valve 12 to the fuel pressure regulator 62, the fuel pressure regulator 62, a pipe connecting the fuel pressure regulator 62 to the carburetor 18b, and the fuel cut-off valve 63 placed in the pipe A3. *Sugimoto*, ¶[0079]. A second fuel system for supplying the second fuel gas from the

external fuel bottle 71 to the engine 30 is constituted by a pipe A4 connecting the connector 14 to the fuel cutoff valve 12, the pipe A2 connecting the fuel system selector valve 12 to the fuel pressure regulator 62, the fuel pressure regulator, the pipe A3 connecting the fuel pressure regulator 62 to the carburetor 18b, and the fuel cutoff valve 63. *Sugimoto*, ¶[0079].

The fuel cutoff valve 63, namely, a fuel cutoff means, is, for example, a normally-open solenoid valve which closes when energized. *Sugimoto*, ¶[0081]. The ECU 89 controls the fuel cutoff valve 63 on the basis of the pressure of the first fuel gas. *Sugimoto*, ¶[0081]. More specifically, the fuel pressure regulator 62 is provided with a pressure sensor 73 for measuring the pressure of the first fuel gas flowing from the fuel bottle 61 to the fuel pressure regulator 62. *Sugimoto*, ¶[0081]. When the pressure of the first fuel gas measured by the pressure sensor 73 is higher than an upper limit pressure P1, the ECU 89 closes the fuel cutoff valve 63 to disconnect the common fuel system from the fuel bottle 61. *Sugimoto*, ¶[0081]. The fuel system selector valve 12 connects either the first fuel system that supplies the first fuel gas to the engine 30 or the second fuel system that supplies the second gas to the engine 30 selectively to the fuel pressure regulator 62. *Sugimoto*, ¶[0082]. The fuel system selector valve 12 can be set in a first position, where the knob of the fuel system selector valve 12 is at a first position marked with "Internal fuel" to connect the first fuel system to the engine 30 to supply the first fuel gas to the engine 30, and in a second position, where the knob of the fuel system selector valve 12 is at a second position marked with "External fuel" to connect the second fuel system to the engine 30 to supply the second fuel gas to the engine 30. *Sugimoto*, ¶[0082].

However, there is no disclosure provided in Sugimoto of a fuel lockout apparatus *coupled to* the mechanical fuel valve, as called for in claim 1. That is, while the Examiner has asserted that Sugimoto discloses "a fuel lockout apparatus 63 (a fuel cutoff is coupled via the regulator 62 to the valve 12) coupled to the mechanical fuel valve," *Office Action*, supra at 4, such an assertion distorts what is disclosed in Sugimoto. Instead, Sugimoto only discloses fuel system selector valve 12 positioned at a junction of pipes A1 and A4 and fuel cut-off valve 63 placed in the pipe A3, *Sugimoto*, ¶[0079], and that fuel cutoff valve 63 is a normally-open solenoid valve that is controlled by ECU 89 on the basis of the pressure of the first fuel gas. *Sugimoto*, ¶[0081]. This positioning of fuel cut-off valve 63 and fuel system selector valve 12 at separate locations along/on pipes A1, A2, A3, A4 can be clearly seen in FIG. 1 of Sugimoto, as fuel cut-off valve 63 is shown therein as being separated from fuel system selector valve 12. Additionally, the control/operation of the fuel cut-off valve 63 and fuel system selector valve 12 are separate from one another, as fuel cutoff valve 63 is opened/closed by ECU 89 based solely on the basis of the

pressure of the first fuel gas – without any regard to the position of fuel system selector valve 12. *Sugimoto*, ¶[0081]. Accordingly, fuel cut-off valve 63 and fuel system selector valve 12 are neither mechanically coupled or operationally coupled, such that there is simply no disclosure in Sugimoto that fuel cut-off valve 63 is *coupled to* fuel system selector valve 12 as called for in claim 1.

As Sugimoto fails to disclose a fuel lockout apparatus coupled to the mechanical fuel valve, Sugimoto cannot be said to anticipate that which is called for in claim 1, as anticipation under pre-AIA 35 U.S.C. §102(a)(2) requires that "[t]he identical invention must be shown [in the reference] in as complete detail as is contained in the ... claim." *MPEP §2131* (citing *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)). Applicant therefore respectfully requests withdrawal of the rejection of claim 1 and the claims dependent therefrom.

Rejection under 35 U.S.C. §102(a)(1) as being anticipated by Pursifull et al.

Claims 1 and 19

The Examiner rejected claims 1 and 19 under 35 U.S.C. §102(a)(1) as being anticipated by Pursifull et al. (US Pub. 2011/0168133) – hereinafter "Pursifull."

In rejecting claims 1 and 19, the Examiner asserted that Pursifull discloses "a mechanical fuel valve 120 actuatable between a first position and a second position to selectively control fuel flow to the dual fuel engine 102 from a first fuel source 112 through a first fuel line 119 and a second fuel source 134 through a second fuel line 140 (Para. [0025], the valve 120 is a three-way mechanical selection valve)" and "a fuel lockout apparatus (Controller 128, pumps 136 114, and solenoid valves 118 126) coupled to the mechanical fuel valve (Fig. 1, the lockout apparatus is coupled to the valve 120 via controller 128 and fuel lines 119/140)." *Office Action*, supra at 5. The Examiner further asserted that Pursifull teaches that "mechanical fuel lockout switch: communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position (Para. [0025], [0028], and [0066], the three-way valve and lockout apparatus determine connection of the first or second fuel to the dual fuel engine 102)." *Id.*

Applicant respectfully disagrees with the rejection. Specifically, Pursifull does not anticipate that which is called for in claims 1 and 19, as anticipation under pre-AIA 35 U.S.C.

§102(a)(2) requires that "[t]he identical invention must be shown [in the reference] in as complete detail as is contained in the ... claim." *MPEP §2131* (citing *Richardson v. Suzuki Motor Co.,* 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)). As will be set forth in detail here below, Pursifull does not disclose each and every element of claims 1 and 19 and thus does not anticipate the claims, as "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *MPEP §2131* (citing *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987)).

Pursifull discloses an engine system 100 that includes an internal combustion engine 102 having one or more cylinders 104 that may receive fuel from one or more fuel injectors 106 that inject fuel in proportion to a pulse width of a signal received from a controller 128. *Pursifull*, ¶[0021]. Fuel may be delivered to the fuel injector 106 from a fuel rail 108 by a fuel system 110. *Pursifull*, ¶[0021]. The fuel system 110 may include a fuel tank 112 and a fuel pump 114 operable by controller 128 to pump fuel from the fuel tank 112 to the fuel rail 108. *Pursifull*, ¶[0022]. A delivery check valve 116 may be positioned downstream of the fuel pump 114 to force fuel pumped from the fuel pump at a predetermined pressure to the fuel rail 108 so that fuel does not return along the same path to the fuel pump. *Pursifull*, ¶[0023]. A first solenoid valve 118 may be positioned downstream of delivery check valve 116 to control the flow of fuel to fuel rail 108 or from the fuel rail to a return line 119. *Pursifull*, ¶[0023]. In some embodiments, fuel system 110 may be what is known as a multi-fuel system that selectively provides a plurality of different types of fuel to the fuel rail 108 based on the mode of operation, such as gasoline and/or liquid propane. *Pursifull*, ¶[0024]. A three-way valve 120 may be positioned upstream of the fuel rail 108 and downstream of the first solenoid valve 118 and the return line 119 to selectively control the flow of a desired type of fuel to the fuel rail 108. *Pursifull*, ¶[0025]. The state of the three-way valve 120 may be controlled by controller 128 to vary which type of fuel is delivered to the fuel rail 108. *Pursifull*, ¶[0025]. Fuel in the fuel rail 108 may be returned to the fuel tank 112 via the return line 119, with an ejector 124 positioned in the return line 119 to provide a single fuel rail evacuation stage. *Pursifull*, ¶[0026]. A return check valve 122 is positioned in the return line 119 downstream of the ejector 124 to force fuel returning from the fuel rail 108 at a predetermined pressure to ejector 124 so that fuel is evacuated from the fuel rail 108. *Pursifull*, ¶[0027]. A second solenoid valve 126 is positioned upstream of the outlet of the ejector 124 and downstream of the fuel tank 112 that may be controlled by controller 128 evacuate the fuel rail 108. *Pursifull*, ¶[0028].

In a method for controlling for controlling a multi-fuel system as described in Pursifull, the method may include operating in the fuel rail pressurization mode where a determination is made if a first fuel from a first fuel stage or a second fuel from a second fuel is selected for delivery to the fuel rail 108. *Pursifull*, ¶[0066]. If the first fuel is selected, operating in the fuel rail pressurization mode may include, switching the three-way valve 120 to the first fuel stage, opening the solenoid valve 118 positioned downstream of the fuel pump 114 and upstream of the fuel rail 108, closing the solenoid valve 126 positioned upstream of the ejector 124 and downstream of the fuel tank 112, and operating the fuel pump 114 to deliver the first fuel from the fuel tank to the fuel rail. *Pursifull*, ¶[0066]. If the second fuel is selected, operating in the fuel rail pressurization mode may include switching the three-way valve 120 to the second fuel stage, and, operating the fuel pump 136 to deliver the second fuel from the fuel tank 134 to the fuel rail 108. *Pursifull*, ¶[0066].

However, there is no disclosure provided in Pursifull of a fuel lockout apparatus *coupled to* the mechanical fuel valve, as called for in claims 1 and 19. That is, while the Examiner has asserted that Pursifull discloses "a fuel lockout apparatus (Controller 128, pumps 136 114, and solenoid valves 118 126) coupled to the mechanical fuel valve (Fig. 1, the lockout apparatus is coupled to the valve 120 via controller 128 and fuel lines 119/140)," *Office Action*, supra at 5, such an assertion distorts what is disclosed in Pursifull. Instead, Pursifull only discloses that controller 128 functions to control pumps 136, 114, solenoid valves 118, 126, and three-way valve 120 based on whether a first or second fuel is selected for use by the engine. *See Pursifull*, ¶[0066]. This controlling of various valves/pumps by controller 128 does **not** teach a coupling of a fuel lockout apparatus and mechanical fuel valve, as called for in claims 1 and 19 – as a control/operation of these components by a common controller is not a "coupling" as would be understood by one skilled in the art. Accordingly, there is simply no disclosure in Pursifull that three-way valve 120is *coupled to* any fuel lockout apparatus – however defined by the Examiner – as called for in claims 1 and 19.

As Pursifull fails to disclose a fuel lockout apparatus coupled to the mechanical fuel valve, Pursifull cannot be said to anticipate that which is called for in claims 1 and 19, as anticipation under pre-AIA 35 U.S.C. §102(a)(2) requires that "[t]he identical invention must be shown [in the reference] in as complete detail as is contained in the ... claim." *MPEP §2131* (citing *Richardson v. Suzuki Motor Co.,* 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)). Applicant therefore respectfully requests withdrawal of the rejection of claims 1 and 19 and the claims dependent therefrom.

Rejection under 35 U.S.C. §103 over Pursifull et al. in view of Sugimoto et al.

Claim 9

The Examiner rejected claim 9 under 35 U.S.C. §103 as being unpatentable over Pursifull in view of Sugimoto. In rejecting claim 9, the Examiner relied on Pursifull as disclosing the claimed "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" and "mechanical fuel valve actuateable 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." *Office Action*, supra at 7. The Examiner admitted that Pursifull does not disclose the claimed fuel regulator system located off board the dual fuel generator, and thus relied on Sugimoto as disclosing a fuel regulator system including "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 "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." *Id.* at 7.-8. Applicant respectfully disagrees with the rejection.

Claim 9 specifically calls for a fuel regulator system located *off board* the dual fuel generator, with the fuel regulator system including a primary pressure regulator coupled to a service valve of the pressurized fuel source and a secondary pressure regulator coupled to the primary pressure regulator. Thus, according to claim 9, each of the primary pressure regulator and the secondary pressure regulator is located *off board* the dual fuel generator. Sugimoto – alone or in combination with Pursifull – fails to teach a fuel regulator system where both a primary pressure regulator and secondary pressure regulator are located off board the dual fuel generator. That is, while pressure reducing device 72 is included as part of external fuel system Fb that is off-board generator 1, *Sugimoto*, ¶[0073], the fuel pressure regulator 62 referenced by the Examiner is *on-board* generator 1 - as the fuel pressure regulator 62 is located between pipe A2 and pipe A3 on generator 1.

In light of the above, Sugimoto – alone or in combination with Pursifull – fails to teach or suggest a fuel regulator system located *off board* the dual fuel generator, with the fuel regulator system including a primary pressure regulator coupled to a service valve of the pressurized fuel source and a secondary pressure regulator coupled to the primary pressure regulator, i.e., each of the primary pressure regulator and the secondary pressure regulator is located *off board* the dual

fuel generator, as called for in claim 9. Claim 9 is therefore patentably distinct from that which is disclosed in Sugimoto and Pursifull and Applicant respectfully requests withdrawal of the rejection of claim 9 and the claims dependent therefrom.

Conclusion

Therefore, in light of at least the foregoing, Applicant respectfully believes that the present application is in condition for allowance. As a result, Applicant respectfully requests timely issuance of a Notice of Allowance for claims 1-26.

Applicant appreciates the Examiner's consideration of these Amendments and Remarks and cordially invites the Examiner to call the undersigned, should the Examiner consider any matters unresolved.

Respectfully submitted,

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Dated: May 15, 2018
Attorney Docket No.: CET1090.019

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General Authorization and Extension of Time

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 50-2623. Should no proper payment be enclosed herewith, as by credit card authorization being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 50-2623. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extensions under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 50-2623. Please consider this a general authorization to charge any fee that is due in this case, if not otherwise timely paid, to Deposit Account No. 50-2623.

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Application Number	14738060
Filing Date	2015-06-12
First Named Inventor	Mark J. Sarder et al.
Art Unit	3747
Examiner Name	Kevin A. Lathers
Attorney Docket Number	CET1090.019

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	2	3412258		1968-11-19	Satter	
	3	3659574		1972-05-02	Reschke et al.	
	4	3718000		1973-02-27	Walker	
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	6	3888223		1975-06-10	Mondt	
	7	4335697		1982-06-22	McLean	
	8	4373493		1983-02-15	Welsh	

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	9	4480595		1984-11-06	Hobby et al.	
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	2	20040139943	A1	2004-07-22	Kern et al.	
	3	20100258099	A1	2010-10-14	Andersson et al.	
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See attached certification statement.

☒ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Kevin R. Rosin/	Date (YYYY-MM-DD)	2018-05-15
Name/Print	Kevin R. Rosin	Registration Number	55584

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EFS Web 2.1.18

Electronic Patent Application Fee Transmittal

Application Number:	14738060
Filing Date:	12-Jun-2015
Title of Invention:	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE
First Named Inventor/Applicant Name:	Mark J. Sarder
Filer:	Kevin Roger Rosin./Robyn Templin
Attorney Docket Number:	CET1090.019

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Miscellaneous:				
SUBMISSION- INFORMATION DISCLOSURE STMT	2806	1	120	120
		Total in USD ($)		**120**

Electronic Acknowledgement Receipt	
EFS ID:	32623422
Application Number:	14738060
International Application Number:	
Confirmation Number:	9670
Title of Invention:	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE
First Named Inventor/Applicant Name:	Mark J. Sarder
Customer Number:	26629
Filer:	Kevin Roger Rosin./Robyn Templin
Filer Authorized By:	Kevin Roger Rosin.
Attorney Docket Number:	CET1090.019
Receipt Date:	15-MAY-2018
Filing Date:	12-JUN-2015
Time Stamp:	10:07:51
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	CARD
Payment was successfully received in RAM	$120
RAM confirmation Number	051518INTEFSW10100400
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Response.pdf	192042 d6db05d9301bc94c09ad66a0a688b799823cd365	yes	16
	Multipart Description/PDF files in .zip description				
	Document Description		**Start**	**End**	
	Amendment/Req. Reconsideration-After Non-Final Reject		1	1	
	Claims		2	7	
	Applicant Arguments/Remarks Made in an Amendment		8	16	
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	SuppIDS.pdf	1035121 69a944958f5680dc62a534631bedd830ce66a24b	no	6
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	30716 07174a4e0d31709228069243 7c4b9763cc86a82d	no	2
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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PTO/SB/06 (09-11)
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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/738,060	Filing Date 06/12/2015	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	05/15/2018	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 26	Minus	** 26	= 0	X $50 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $230 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

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This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/738,060	06/12/2015	Mark J. Sarder	CET1090.019	9670

26629 7590 02/22/2018
ZIOLKOWSKI PATENT SOLUTIONS GROUP, SC (ZPS)
136 S WISCONSIN ST
PORT WASHINGTON, WI 53074

EXAMINER
LATHERS, KEVIN ANTHONY

ART UNIT	PAPER NUMBER
3747	

NOTIFICATION DATE	DELIVERY MODE
02/22/2018	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

info@zpspatents.com
sml@zpspatents.com

PTOL-90A (Rev. 04/07)

Office Action Summary	Application No. 14/738,060	Applicant(s) SARDER ET AL.	
	Examiner KEVIN A. LATHERS	Art Unit 3747	AIA (First Inventor to File) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11/03/2017*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-26* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1,7-9,14-19 and 22-26* is/are rejected.

8)☐ Claim(s) *2-6,10-13,20 and 21* is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☐ Other: _____.

DETAILED ACTION

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Claim Interpretation

The following is a quotation of 35 U.S.C. 112(f):

> (f) Element in Claim for a Combination. – An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

The following is a quotation of pre-AIA 35 U.S.C. 112, sixth paragraph:

> An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

1. This application includes one or more claim limitations that do not use the word “means,” but are nonetheless being interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph, because the claim limitation(s) uses a generic placeholder that is coupled with functional language without reciting sufficient structure to perform the recited function and the generic placeholder is not preceded by a structural modifier. Such claim limitation(s) is/are: “regulator mounting device” in claims 15-17. A "device" is a generic term for any structure, therefore this limitation amounts to "a means for mounting a regulator."

Because this/these claim limitation(s) is/are being interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph, it/they is/are being interpreted to

cover the corresponding structure described in the specification as performing the claimed function, and equivalents thereof.

If applicant does not intend to have this/these limitation(s) interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph, applicant may: (1) amend the claim limitation(s) to avoid it/them being interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph (e.g., by reciting sufficient structure to perform the claimed function); or (2) present a sufficient showing that the claim limitation(s) recite(s) sufficient structure to perform the claimed function so as to avoid it/them being interpreted under 35 U.S.C. 112(f) or pre-AIA 35 U.S.C. 112, sixth paragraph.

Claim Rejections - 35 USC § 102

2. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

> (a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale or otherwise available to the public before the effective filing date of the claimed invention.

3. **Claim(s) 1 and 7 is/are rejected under 35 U.S.C. 102(a)(1) as being clearly anticipated by Sugimoto (US 2007/0137591).**

4. **Regarding claim 1,** Champion discloses mechanical fuel lockout switch (Fig. 1, shown switch system) for a dual fuel engine (Fig. 1, shown engine 30) comprising:

a mechanical fuel valve 12 actuateable between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source 61 through a first fuel line A1 and a second fuel source 71 through a second fuel line A5 (Fig. 1, shown lines and valve); and

a fuel lockout apparatus 63 (a fuel cutoff is coupled via the regulator 62 to the valve 12) coupled to the mechanical fuel valve;

wherein the mechanical fuel lockout switch:

communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position (Para. [0082], the switch has multiple positions which allow valve 12 connect either of the lines A1 or A4 to line A2 and also activate lockout apparatus 63).

5. **Regarding claim 7,** the mechanical fuel lockout switch for a dual fuel engine of claim 1, wherein the mechanical fuel valve and the fuel lockout apparatus operate together to ensure that fuel from the first fuel source and fuel from the second fuel source are not simultaneously delivered to the dual fuel engine (Para. [0082], the system does not allow two fuels to be delivered simultaneously).

6. Claim(s) 1, 7, 8, 19, 22, and 26 is/are rejected under 35 U.S.C. 102(a)(1) as being clearly anticipated by Pursifull et al (US 2011/0168133)

7. **Regarding claims 1 and 19,** Pursifull discloses a mechanical fuel lockout switch for a dual fuel engine (Fig. 3, shown dual fuel engine with lockout switch) and method of constructing it comprising: a mechanical fuel valve 120 actuateable between a first position and a second position to selectively control fuel flow to the dual fuel engine 102 from a first fuel source 112 through a first fuel line 119 and a second fuel source 134 through a second fuel line 140 (Para. [0025], the valve 120 is a three-way mechanical selection valve); and

8. a fuel lockout apparatus (Controller 128, pumps 136 114, and solenoid valves 118 126) coupled to the mechanical fuel valve (Fig. 1, the lockout apparatus is coupled to the valve 120 via controller 128 and fuel lines 119/140);

9. wherein the mechanical fuel lockout switch: communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position (Para. [0025], [0028], and [0066], the three-way valve and lockout apparatus determine connection of the first or second fuel to the dual fuel engine 102).

10. The apparatus above having all the parts coupled together and therefore being "coupled" and "provided" as per the method in claim 19.

11. **Regarding claim 7,** Pursifull discloses the mechanical fuel lockout switch for a dual fuel engine of claim 1, wherein the mechanical fuel valve and the fuel lockout apparatus operate together to ensure that fuel from the first fuel source and fuel from

the second fuel source are not simultaneously delivered to the dual fuel engine (Para. [0025], [0028], and [0066], the lockout apparatus cuts off the fuel supply between the lines).

12. **Regarding claims 8 and 26,** Pursifull discloses the mechanical fuel lockout switch for a dual fuel engine of claims 7 and 19, wherein the first fuel source provides gasoline as liquid fuel from a liquid fuel tank to the dual fuel engine and the second fuel source provides LPG fuel from a pressurized fuel container to the dual fuel engine (Para. [0040], the multi fuel system may be liquid propane (gaseous fuel) and gasoline (liquid fuel)).

13. **Regarding claim 22,** the modified Pursifull discloses the method of claim 19 as disclosed above, wherein the fuel lockout apparatus comprises a fuel inlet cover configured to actuate in unison with the mechanical fuel valve to cover a fuel inlet on the internal combustion engine for the second fuel source when the mechanical fuel valve is in the first position and uncover the fuel inlet when the mechanical fuel valve is in the second position (Para. [0025], [0028], and [0066], the lockout apparatus cuts off the fuel supply between the lines, by considering the line which connects to the lockout valve as a "fuel inlet" then the valve cutting off flow is then covering the inlet to disallow fuel flow).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have

> been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 9, 14-18, and 23-25 is/are rejected under 35 U.S.C. 103 as being unpatentable over Pursifull et al (US 2011/0168133) in view of Sugimoto et al (US 2007/0137591).

16. **Regarding claim 9,** Pursifull discloses a dual fuel engine and fuel delivery system comprising:

a dual fuel engine (Fig. 1, shown) 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 (Para. [0040], the multi fuel system may be pressurized liquid propane (gaseous fuel) and gasoline (liquid fuel)); and a mechanical fuel valve actuateable 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 (Para. [0025], [0028], and [0066], the three-way valve and lockout apparatus determine connection of the first or second fuel to the dual fuel engine 102).

17. Pursifull fails to disclose a fuel regulator system located off board the dual fuel engine, the fuel regulator system comprising: 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 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.

18. Sugimoto discloses a dual fuel engine and delivery system (Fig. 1, as shown) wherein the system includes an off-board gaseous fuel system (Fb) which includes an off-board pressure regulator 72 which feeds fuel into an engine system 1 which includes another pressure regulator 62. The inclusion of pressure reduction devices for the gasification of liquid-held fuel allows for an effective cooling of the fuel system and systems (Para. [0010]) while allowing the dual fuel engine to be powered by an external fuel tank attached to it in an off board fashion such as in emergency situations (Para. [0002]).

19. Therefore, it would have been obvious to one of ordinary skill in the art before the filing date of the invention to modify the device of Pursifull with the pressure regulators and gaseous fuel system methods of Sugimoto in order to improve the cooling of the fuel system parts through pressure reduction as well as regulate the pressure from an external attached fuel tank which allows the dual fuel engine system to be used in varying situations such as emergency ones using an external fuel source.

20. **Regarding claim 14,** the modified Pursifull discloses the dual fuel generator and fuel delivery system of claim 9, 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 (Fig. 1 of Sugimoto shows that the modification of Pursifull to includes an external source of gaseous fuel and regulators makes use of a connection hose coupling 14).

21. **Regarding claims 15,** the modified Pursifull discloses the dual fuel generator and fuel delivery system of claim 9, further comprising a regulator mounting device (a bracket as per applicant's disclosure on in Para. [0024] of the disclosure) secured to the pressurized fuel source with at least the secondary pressure regulator mounted on the regulator mounting device (Fig. 1 of Sugimoto which discloses the regulator systems, the regulator 72 shown is attached to the fuel tank system 71).

22. The modified Pursifull fails to specifically note a bracket being used for the fixation of the regulator 72. However, it would have been obvious to one of ordinary skill in the art before the filing date of the invention to attach the regulator 72 using some device wherein a bracket is an extremely old and well-known fixation device and one of ordinary skill in the art would have known to apply a known device and technique of mounting a regulator on a fuel tank, such as a bracket, to yield the predictable results of fixing the regulator to its fuel system.

23. **Regarding claim 16,** the modified Pursifull discloses the dual fuel generator and fuel delivery system of claim 15, but fails to disclose wherein the primary pressure regulator is mounted on the regulator mounting device. The modified Pursifull fails to disclose the two regulators being located in positions where they would be mounted making use of the same mounting bracket.

However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to mount both regulators in a similar location on the same bracket since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

24. **Regarding claim 17,** the modified Pursifull discloses the dual fuel generator and fuel delivery system of claim 16, but fails to disclose wherein the pressurized fuel source comprises a pressurized fuel container having a collar; and wherein the regulator mounting device secures to the collar so that the primary and secondary pressure regulators are positioned adjacent each other along an outer periphery of the collar.

25. In this case the claim pertains to the routine and known art of using propane tanks as a fuel tank source as these devices are well-known in the art to have a "collar" piece which often has regulators attached to it. While the art of Pursifull and Sugimoto never make reference to this specific old and well-known device, they do make use of fuel tanks that could easily be substituted with them. Therefore, examiner makes official notice that it is old and well-known to make use of standard-in-the-art propane tanks with regulators attached to their collars as this would have allowed the modified Pursifull to make use of the common, cheap, and easy-to-use propane tanks for its regulation and propane tank systems. Some examples of such tanks can be seen at: RVDoctor (Oct. 2010, http://www.rvdoctor.com/2012/10/disconcerting-propane-leaks-on-rv.html) which shows two propane tanks with a regulator attached to their collar; and Nooutage.com (Aug. 27th, 2006, https://web.archive.org/web/20060928183104/http://www.nooutage.com:80/images/BS-7KW_Power_Now_tanks.jpg) which shows propane tanks with regulators attached to their collars.

26. **Regarding claim 18,** the modified Pursifull discloses the dual fuel generator and fuel delivery system of claim 9, but fails to disclose wherein the primary and secondary pressure regulators are integral components of a dual stage pressure regulator.

27. However, It would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the regulators into a two-stage regulator, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together involves only routine skill in the art. Howard v. Detroit Stove Works, 150 U.S. 164 (1893).

28. Claims 23-25 are rejected using Pursifull as modified by Sugimoto in the same manner as applied to claim 9 and its dependent claims above.

29. **Regarding claim 23,** the modified Pursifull discloses the method of claim 19, further comprising coupling a fuel regulator system to the second fuel source to reduce fuel pressure therefrom and deliver fuel to the second fuel line at a pressure required for operation of the internal combustion engine (Fig. 1 of Sugimoto shows the regulators in series reducing pressure).

30. **Regarding claim 24,** the modified Pursifull discloses the method of claim 23, further comprising mounting the fuel regulator system to the second fuel source located off-board the internal combustion engine (Fig. 1 of Sugimoto as modified onto Pursifull and shown).

31. **Regarding claim 25,** the modified Pursifull discloses the method of claim 23, further comprising: coupling one end of a quick-disconnect hose coupling to an inlet on the internal combustion engine for the second fuel source; and coupling a mating end of

the quick-disconnect hose coupling to an outlet of the fuel regulator system (Fig. 1 of Sugimoto as modified onto Pursifull and shown).

Allowable Subject Matter

32. Claims 2-6, 10-13, 20, and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

33. The following is a statement of reasons for the indication of allowable subject matter: The closest prior art fails to disclose or make obvious the lockout apparatus prevents actuation of the mechanical fuel valve between its two positions and therefore prevents communication of the fuel source with their respective lines and the engine. Further, the closest prior art fails to disclose or make obvious the fuel lockout apparatus preventing the second fuel source from coupling to the second fuel line, wherein this means that not only are the two not in fluid communication but they are not physically connected in any manner.

34. Champion discloses a dual fuel system as discussed above, but its lockout switch does not prevent the hose of the propane tank from even coupling to the engine fuel system lines.

Response to Arguments

35. Applicant's arguments with respect to claims 1-26 have been considered but are moot because the arguments do not apply to any of the references being used in the current rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEVIN A. LATHERS whose telephone number is (571)272-1050. The examiner can normally be reached on 10:00 am-7:00 pm EST, Monday to Thursday.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lindsay Low can be reached on 571-272-1196. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KEVIN A LATHERS/
Primary Examiner, Art Unit 3747

Notice of References Cited	Application/Control No. 14/738,060	Applicant(s)/Patent Under Reexamination SARDER ET AL.	
	Examiner KEVIN A. LATHERS	Art Unit 3747	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-2007/0137591 A1	06-2007	Sugimoto; Yasuhiro	F02B43/00	123/41.7
*	B	US-2011/0168133 A1	07-2011	Pursifull; Ross Dykstra	F02M37/0064	123/495
	C	US-				
	D	US-				
	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

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NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14738060	SARDER ET AL.
	Examiner	Art Unit
	KEVIN A LATHERS	3747

CPC- SEARCHED		
Symbol	Date	Examiner
F02D19/0613, 16/0605, 19/0647	07/28/2017	/K.L./
Y02T10/36	07/28/2017	/K.L./

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

SEARCH NOTES		
Search Notes	Date	Examiner
EAST including inventor and assignee search.	07/28/2017	/K.L./
Google key word search (e.g. "dual fuel generator").	07/28/2017	/K.L./
EAST and google search.	02/15/2018	/K.L./

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14738060	SARDER ET AL.
	Examiner	**Art Unit**
	KEVIN A LATHERS	3747

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	07/28/2017	02/15/2018							
	1	✓	✓							
	2	✓	O							
	3	✓	O							
	4	O	O							
	5	O	O							
	6	O	O							
	7	✓	✓							
	8	✓	✓							
	9	✓	✓							
	10	✓	O							
	11	O	O							
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	13	O	O							
	14	✓	✓							
	15	✓	✓							
	16	✓	✓							
	17	✓	✓							
	18	✓	✓							
	19	✓	✓							
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	23	✓	✓							
	24	✓	✓							
	25	✓	✓							
	26	✓	✓							

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S1	445	F02D19/0613.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:25
S2	1204	F02D19/0605.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:25
S3	3408	F02D19/0647.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:25
S4	15258	Y02T10/36.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:25
S5	808	(S1 S2 S3 S4) and (switch valve) near20 (propane natural adj gas gaseous lng cng) near20 (gasoline liquid diesel)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:28
S6	79	(S1 S2 S3 S4) and (switch valve) near20 (propane natural adj gas gaseous lng cng) near20 (gasoline liquid diesel) and (second secondary auxiliary) near5 (regulat$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:29
S7	64	(S1 S2 S3 S4) and (switch valve) near20 (propane natural adj gas gaseous lng cng) near20 (gasoline liquid diesel) and (second secondary auxiliary) adj (regulat$3 pressure)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:44
S8	28	("5450832" | "20130220274" | "5325835"	USPAT	OR	OFF	2017/07/27

		| "5320078" | "4619240" | "6082323" | "6453877" | "5171487" | "6223730" | "6213083" | "4489699" | "5287839" | "8590510" | "5673670" | "4450821" | "5816224" | "6276345" | "4502453" | "20130047964" | "4372276" | "6401685" | "7905469" | "2722208" | "4895124" | "5161496" | "5379740" | "5438968" | "5419291" | "6914342" | "8342158").PN.				14:45
S9	124	("5450832" | "20130220274" | "5325835" | "5320078" | "4619240" | "6082323" | "6453877" | "5171487" | "6223730" | "6213083" | "4489699" | "5287839" | "8590510" | "5673670" | "4450821" | "5816224" | "6276345" | "4502453" | "20130047964" | "4372276" | "6401685" | "7905469" | "2722208" | "4895124" | "5161496" | "5379740" | "5438968" | "5419291" | "6914342" | "8342158").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:45
S10	421	(duel dual) near5 fuel near20 (engine generator) same (switch valve) near20 between	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:46
S11	0	dual adj fuel near20 engine same "switchover valve"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 15:17
S12	44	dual adj fuel near20 engine same (switch switchover) near5 valve	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 15:19
S13	49	"6591817"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 15:19
S14	63	("3799125" | "4150645" | "4265208" | "4303049" | "4305350" | "4323046" | "4353345" | "4391251" | "4398517" | "4524033" | "4671243" | "5450832" | "5524582" | "5623907" | "5720266" | "5816224" | "6035837").PN. OR ("6591817").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 15:20
S15	80	dual adj fuel near20 engine same (switch switchover select$3) near5 valve	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 15:21

S16	30	(("SARDER") near3 ("Mark")).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 15:25
S17	28	(("SOTIRIADES") near3 ("Aleko")).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 15:25
S18	41	(("DEHN") near3 ("James")).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 15:25
S19	15	(("JENISON") near3 ("Leigh")).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 15:25
S20	16	(("CHAMPION") near3 ("ENGINE") near3 ("TECHNOLOGY") near3 ("LLC")).AANM.	USPAT	OR	OFF	2017/07/27 15:25
S21	19	(("CHAMPION") near3 ("ENGINE") near3 ("TECHNOLOGY") near3 ("LLC")).as.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 15:26
S22	5	("20040240141" | "20060169238" | "20130098349" | "20130122439" | "4489699").PN. OR ("9435273").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 15:42
S23	41	("1973142" | "2315882" | "2381304" | "4068639" | "4227497" | "4335697").PN. OR ("4489699").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 15:43
S24	97	(dual multi multiple plural plurality) adj fuel near20 engine same (switch switchover changeover change switch$3) near5 (valve switch)	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 16:02
S25	1	(09/813622).APP.	USPAT; USOCR	OR	OFF	2017/07/27 16:03
S26	63	("3799125" | "4150645" | "4265208" | "4303049" | "4305350" | "4323046" | "4353345" | "4391251" | "4398517" | "4524033" | "4671243" | "5450832" | "5524582" | "5623907" | "5720266" | "5816224" | "6035837").PN. OR ("6591817").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 16:03
S27	64	("4335697" | "4393848" | "4430978" | "4606322" | "4683864" | "4825842" | "4922862" | "5379740" | "5474047" | "5479906" | "5755211" | "5775282").PN. OR ("6035837").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 16:34
S28	27	("5999888" | "6543395" | "4619240" | "20140366577" | "20120168023" | "20140202430" | "4463735" | "5668310" | "5224457").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/28 10:32
S29	0	(14/156204).APP.	USPAT; USOCR	OR	OFF	2017/07/28 11:33
S30	5	(gas gasoline liquid near5 fuel) near20 (propane natural adj gas) near20 (fill$3 fueling) same (quick-connect connect$3) near20 (cover flange)	USPAT; USOCR	OR	OFF	2017/07/28 11:47
S31	109	(gas gasoline liquid near5 fuel) near20 (propane natural adj gas) near20 (fill$3 fueling) same (quick-connect connect$3) near20 (cover flange)	US-PGPUB; USPAT; USOCR; FPRS;	OR	OFF	2017/07/28 11:47

			EPO; JPO; DERWENT; IBM_TDB			
S32	280	(gas gasoline liquid near5 fuel) near20 (propane natural adj gas) near20 (fill$3 fueling) same (cover flange)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/28 11:48
S33	171	(gas gasoline liquid near5 fuel) near20 (propane natural adj gas) near20 (fill$3 fueling) same (cover flange) not S31	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/28 11:48
S34	5	"9435273"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/28 14:35
S35	1	"20070137591"	USPAT	OR	OFF	2018/02/12 15:56
S37	34	(champion near3 engine).as.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/02/12 15:59
S38	95	dual adj fuel near20 valve near10 switch	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/02/12 16:19
S39	48	"4489699"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/02/12 16:30
S40	5	"20070137591"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/02/12 16:30
S41	29	"3412258"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/02/12 16:30

S42	3	"20100258099"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/02/12 16:30
S43	53	"5611312"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/02/12 16:30
S44	138	(S39 S40 S41 S42 S43)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2018/02/12 16:31
S45	1	(10/591304).APP.	USPAT; USOCR	OR	OFF	2018/02/12 16:45
S46	6	("6332433" | "7146962").PN. OR ("7325519").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2018/02/12 16:46
S47	35	(US-20020014077-$ or US-20030168024-$ or US-20110168133-$ or US-20120204835-$ or US-20030010320-$ or US-20160363099-$ or US-20170037796-$ or US-20020134362-$ or US-20140202430-$ or US-20160221518-$ or US-20070137591-$).did. or (US-5320078-$ or US-5450832-$ or US-5816224-$ or US-6591817-$ or US-5524582-$ or US-4570605-$ or US-4712516-$ or US-9435273-$ or US-4489699-$ or US-4305350-$ or US-4353345-$ or US-6035837-$ or US-6904873-$ or US-7045916-$ or US-5092305-$).did. or (US-2558884-$ or US-2470747-$ or US-3022425-$ or US-3451424-$).did. or (JP-2004278332-$).did. or (US-20080290531-$ or US-20130047964-$ or US-4463735-$ or CN-203796423-$).did.	US-PGPUB; USPAT; USOCR; JPO; DERWENT	OR	OFF	2018/02/12 17:19
S48	35	(US-20020014077-$ or US-20030168024-$ or US-20110168133-$ or US-20120204835-$ or US-20030010320-$ or US-20160363099-$ or US-20170037796-$ or US-20020134362-$ or US-20140202430-$ or US-20160221518-$ or US-20070137591-$).did. or (US-5320078-$ or US-5450832-$ or US-5816224-$ or US-6591817-$ or US-5524582-$ or US-4570605-$ or US-4712516-$ or US-9435273-$ or US-4489699-$ or US-4305350-$ or US-4353345-$ or US-6035837-$ or US-6904873-$ or US-7045916-$ or US-5092305-$).did. or (US-2558884-$ or US-2470747-$ or US-3022425-$ or US-3451424-$).did. or (JP-2004278332-$).did. or (US-20080290531-	US-PGPUB; USPAT; USOCR; JPO; DERWENT	OR	OFF	2018/02/13 17:40

		$ or US-20130047964-$ or US-4463735-$ or CN-203796423-$).did.				
S50	17	S48 and regulator	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2018/02/13 17:40

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(Not for submission under 37 CFR 1.99)

Application Number	14738060
Filing Date	2015-06-12
First Named Inventor	Mark J. Sarder et al.
Art Unit	3747
Examiner Name	Kevin A. Lathers
Attorney Docket Number	CET1090.019

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	1	2060477	CN	U	1990-08-15	Zhao Yunying		

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	Art Unit	3747
	Examiner Name	Kevin A. Lathers
	Attorney Docket Number	CET1090.019

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Examiner Signature		Date Considered	

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14738060
	Filing Date	2015-06-12
	First Named Inventor	Mark J. Sarder et al.
	Art Unit	3747
	Examiner Name	Kevin A. Lathers
	Attorney Docket Number	CET1090.019

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☒ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Stephanie M. Laundre/	Date (YYYY-MM-DD)	2018-02-22
Name/Print	Stephanie M. Laundre	Registration Number	65124

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The information provided by you in this form will be subject to the following routine uses:

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2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

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6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

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EFS Web 2.1.17

Espacenet

Bibliographic data: CN2060477 (U) — 1990-08-15

CARBURETTOR

Inventor(s): YUNYING ZHAO [CN] ± (ZHAO YUNYING)

Applicant(s): ZHAO YUNYING [CN] ± (ZHAO YUNYING)

Classification: **- international:** ***F02M3/05;*** (IPC1-7): F02M3/05
- cooperative:

Application number: CN1989217629U 19890927

Priority number(s): CN1989217629U 19890927

Abstract of CN2060477 (U)

The utility model relates to a carburetor used for a combustion engine. The carburetor used for a combustion engine is characterized in that a fuel oil switch is arranged at a fuel inlet of a carburetor, and a restoring spring is arranged on a valve core of the fuel oil switch. A torsional handle of the valve core is connected with an operation draw rod. When an automobile is put into gear to slide down a slope, the fuel oil switch is closed by a driver through the operation draw rod, and the purpose of oil saving is achieved. When the operation draw rod is released, the fuel oil switch is automatically restored. The structure of the carburetor used for a combustion engine is simple. The current carburetor is convenient to modify. The carburetor used for a combustion engine is particularly suitable for a vehicle which often runs in a mountain area.

(19)中华人民共和国专利局　　(11)公告号 CN 2060477U

(12)实用新型专利申请说明书

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(71)申请人 赵云英
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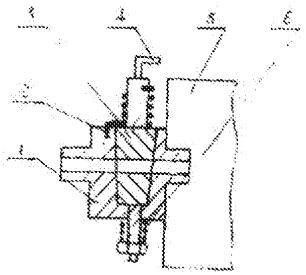
(74)专利代理机构 河北省专利事务所
代理人 朱振新

说明书页数: 2　　附图页数: 2

(54)实用新型名称 一种汽化器

(57)摘要

供摩托发动机使用的汽化器，其特征是汽化器的燃料入口处设有一磁簧开关被开关的阀芯上设有复位弹簧，阀芯拉把与操作拉杆连接。当汽车下坡连续行时，司机经拉杆关闭磁簧开关，达到节油目的，再放拉杆，磁簧开关自动复位。本实用新型结构简单，对现行汽化器改造方便，特别适用于经常在山区行驶的车辆。



(56)第1452号

权 利 要 求 书

1、一种摩托发动机使用的汽化器，其特征在于所述的汽化器燃油入口处，有一燃油开关。

2、根据权利要求1所述的汽化器，其特征在于燃油开关由阀体1、复位弹簧2、阀芯3、扭把4和拉紧弹簧6组成。

3、根据权利要求1或2所述的汽化器，其特征在于所述阀体1与汽化器外壳5，可以设计为一体或分离式。

说　　明　　书

一种汽化器

本实用新型属于一种供燃烧发动机使用的汽化器。

现有汽车发动机使用的汽化器，燃油入口都没有燃油开关，给操作规程规定，汽车下坡时，不得空挡滑行，以保证汽车发动机带动压气机工作，使制车有足够气压，而汽车下坡挂挡滑行时，发动机处于被驱动状态，发动机不需要汽化器供给可燃混合汽，现有技术决定了只要发动机工作，燃油泵就通过汽化器向发动机供给可燃混合汽，这样大量的燃油被浪费掉。

本实用新型的目的是，当汽车下坡挂挡滑行时，关闭汽化器燃油入口，使发动机在不烧燃油的情况下，带动机油泵、压汽机工作，达到下坡节油的目的。

以下结合附图对本实用新型进行详细描述。

附图1为汽车发动系统示意图、

附图2为本实用新型燃油开关结构示意图。

参看附图1，发动机工作时，带动机油泵、燃油泵和压气机工作，机油泵向发动机供给润滑机油，燃油泵通过汽化器向发动机供给可燃混合汽，压气机供制车足够的气压，所以现有技术的缺点是，只要发动机工作，燃油泵就会通过汽化器向发动机供给可燃混合气。

当汽车下坡时，汽车可挂挡滑行，由于发动机处于被驱动状态，不需要汽化器供给可燃混合气，司机可通过拉杆关闭汽化器燃油入口开关，使燃油不能进入汽化器，同时关闭点火开关，发动机在不

Exhibit 1003, Page 366
Petitioner MWE Investments, LLC, et al.

烧燃油的情况下，带动机油泵、压气机工作，这样即保证了发动机的润滑和刹车气压，又达到节省燃油的目的。下坡终止，打开点火开关和汽化器燃油入口开关，汽车恢复正常运行。

参看图3，汽化器燃油进口、由阀体1、复位弹簧2、阀芯3、扭把4及拉紧弹簧6组成了燃油开关，阀体1与汽化器外壳5可是分离式，也可制成一体，需要关闭燃油进口时，司机通过拉杆推动扭把4，使阀芯3上的孔与阀体1上的孔错开，使汽化器进口断开，释放拉杆阀芯3在复位弹簧2作用下复位，打开汽化器进油口，拉紧弹簧6将阀芯3与阀体1紧密接触，以防接触面漏油。

本实用新型结构简单，对经常行驶在山区的车辆，节油效果更显著，实现了车辆下坡连续安全滑行，可广泛用于各种汽油车和燃油车。

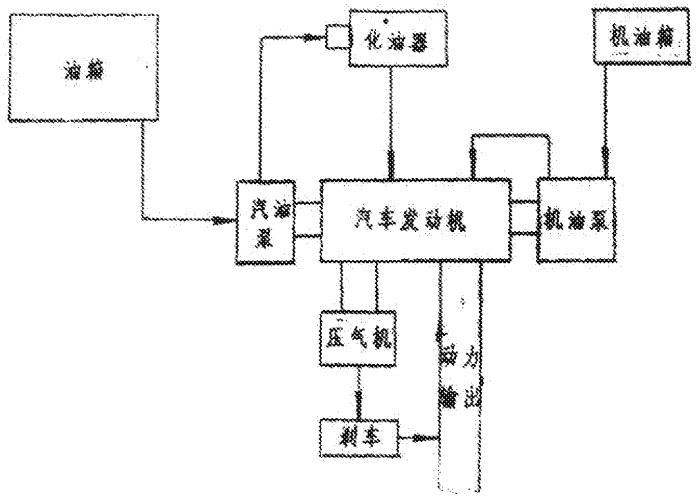


图1

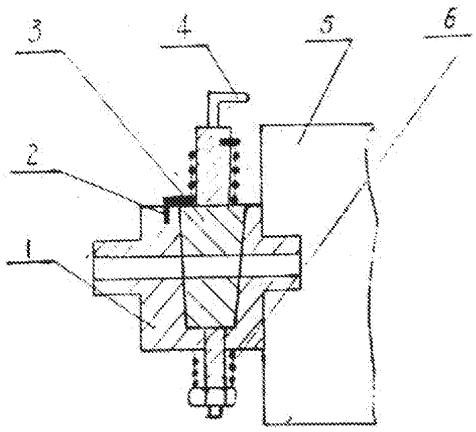


图2

Electronic Acknowledgement Receipt

EFS ID:	31860663
Application Number:	14738060
International Application Number:	
Confirmation Number:	9670
Title of Invention:	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE
First Named Inventor/Applicant Name:	Mark J. Sarder
Customer Number:	26629
Filer:	Stephanie Mueller Laundre/Robyn Templin
Filer Authorized By:	Stephanie Mueller Laundre
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Receipt Date:	22-FEB-2018
Filing Date:	12-JUN-2015
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Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	SuppIDS.pdf	1034613 08ef55ceaeaf84377c6973945e0da01144acebc4	no	4

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2	Foreign Reference	FPD1-CN2060477U.pdf	451233 2141ee71ce889dab107045535acd687116525e46	no	7
Warnings:					
Information:					
			Total Files Size (in bytes):	1485846	

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Customer No. 26629 Patent
Confirmation No. 9670 Attorney Docket No. CET1090.019

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	:	Sarder et al.
Serial No.	:	14/738,060
Filed	:	June 12, 2015
For	:	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE
Group Art No.	:	3747
Examiner	:	Kevin A. Lathers

CERTIFICATION UNDER 37 CFR 1.8(a) and 1.10

I hereby certify that, on the date shown below, this correspondence is being:

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37 CFR 1.8(a) **37 CFR 1.10**

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■ transmitted by EFS-WEB addressed to **Examiner Kevin A. Lathers** at the Patent and Trademark Office.

Date: November 3, 2017 /Robyn L. Templin/
Signature

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT/RESPONSE TO OFFICE ACTION
MAILED AUGUST 3, 2017

Dear Sir:

Responsive to the Office Action mailed August 3, 2017, please consider the following remarks:

In the Claims

1. (Original) A mechanical fuel lockout switch for a dual fuel engine comprising:

a mechanical fuel valve actuateable between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line; and

a fuel lockout apparatus coupled to the mechanical fuel valve;

wherein the mechanical fuel lockout switch:

communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and

communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position.

2. (Original) The mechanical fuel lockout switch for a dual fuel engine of claim 1, wherein the fuel lockout apparatus prevents actuation of the mechanical fuel valve to the first position when the second fuel source communicates with the dual fuel engine.

3. (Original) The mechanical fuel lockout switch for a dual fuel engine of claim 1, wherein the fuel lockout apparatus is configured to:

prevent the second fuel source from coupling to the second fuel line while the mechanical fuel valve is in the first position; and

permit the second fuel source to couple to the second fuel line while the mechanical fuel valve is in the second position.

4. (Original) The mechanical fuel lockout switch for a dual fuel engine of claim 3, wherein the fuel lockout apparatus comprises a flange rigidly coupled to the mechanical fuel valve that covers an inlet of the second fuel line while the mechanical fuel valve is in the first position and uncovers the inlet of the second fuel line while the mechanical fuel valve is in the second position.

5. (Original) The mechanical fuel lockout switch for a dual fuel engine of claim 4, wherein the mechanical fuel valve rotates between the first position and the second position and the flange rotates transversely across the inlet of the second fuel line.

6. (Original) The mechanical fuel lockout switch for a dual fuel engine of claim 4, further comprising;

a first end of a quick-disconnect hose coupling attached to the inlet of the second fuel line; and

a second end of the quick-disconnect hose coupling attached to the second fuel source to mate with the first end of the quick-disconnect hose coupling to couple the second fuel source to the second fuel line.

7. (Original) The mechanical fuel lockout switch for a dual fuel engine of claim 1, wherein the mechanical fuel valve and the fuel lockout apparatus operate together to ensure that fuel from the first fuel source and fuel from the second fuel source are not simultaneously delivered to the dual fuel engine.

8. (Original) The mechanical fuel lockout switch for a dual fuel engine of claim 7, wherein the first fuel source provides liquid fuel from a liquid fuel tank to the dual fuel engine and the second fuel source provides gaseous fuel from a pressurized fuel container to the dual fuel engine.

9. (Original) A dual fuel generator and fuel delivery system comprising:

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;

a fuel regulator system located off board the dual fuel generator, the fuel regulator system comprising:

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

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

a mechanical fuel valve actuateable 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.

10. (Original) The dual fuel generator and fuel delivery system of claim 9 further comprising a fuel lockout apparatus coupled to the mechanical fuel valve; and

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.

11. (Original) The dual fuel generator and fuel delivery system of claim 9, wherein mechanical fuel valve opens and closes the liquid fuel line to selectively control fuel flow from the liquid fuel source to the dual fuel generator; and further comprises:

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.

12. (Original) The dual fuel generator and fuel delivery system of claim 11, 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.

13. (Original) The dual fuel generator and fuel delivery system of claim 11, 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 mechanical fuel lockout switch the inlet of the gaseous fuel line when the mechanical fuel valve closes the liquid fuel line.

14. (Original) The dual fuel generator and fuel delivery system of claim 9, 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.

15. (Original) The dual fuel generator and fuel delivery system of claim 9, further comprising a regulator mounting device secured to the pressurized fuel source with at least the secondary pressure regulator mounted on the regulator mounting device.

16. (Original) The dual fuel generator and fuel delivery system of claim 15, wherein the primary pressure regulator is mounted on the regulator mounting device.

17. (Original) 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 secures to the collar so that the primary and secondary pressure regulators are positioned adjacent each other along an outer periphery of the collar.

18. (Original) The dual fuel generator and fuel delivery system of claim 9, wherein the primary and secondary pressure regulators are integral components of a dual stage pressure regulator.

19. (Original) A method of assembling a mechanical fuel lockout switch for an internal combustion engine comprising:

providing an internal combustion engine configured to operate on a fuel from a first fuel source and a different fuel from a second fuel source;

coupling a mechanical fuel valve to the internal combustion engine actuateable between a first position and a second position to selectively control fuel flow to the internal

combustion engine from the first fuel source through a first fuel line and the second fuel source through a second fuel line; and

coupling a fuel lockout apparatus to the mechanical fuel valve;

wherein when the mechanical fuel valve is in the first position, the fuel lockout apparatus communicates the first fuel source to the internal combustion engine and prevents the second fuel source from coupling to the internal combustion engine, and actuation of the mechanical fuel valve to the second position causes the fuel lockout apparatus to permit the second fuel source to couple to the internal combustion engine, and interrupts the first fuel source communication with the internal combustion engine.

20. (Original) The method of claim 19, wherein the fuel lockout apparatus prevents actuation of the mechanical fuel valve to the first position when the second fuel source is coupled to the internal combustion engine.

21. (Original) The method of claim 20, wherein the fuel lockout apparatus is further configured to:

prevent coupling of the second fuel source to the second fuel line while the mechanical fuel valve is in the first position; and

permit coupling of the second fuel source to the second fuel line while the mechanical fuel valve is in the second position.

22. (Original) The method of claim 19, wherein the fuel lockout apparatus comprises a fuel inlet cover configured to actuate in unison with the mechanical fuel valve to cover a fuel inlet on the internal combustion engine for the second fuel source when the mechanical fuel valve is in the first position and uncover the fuel inlet when the mechanical fuel valve is in the second position.

23. (Original) The method of claim 19, further comprising coupling a fuel regulator system to the second fuel source to reduce fuel pressure therefrom and deliver fuel to the second fuel line at a pressure required for operation of the internal combustion engine.

24. (Original) The method of claim 23, further comprising mounting the fuel regulator system to the second fuel source located off-board the internal combustion engine.

25. (Original) The method of claim 23, further comprising:

coupling one end of a quick-disconnect hose coupling to an inlet on the internal combustion engine for the second fuel source; and

coupling a mating end of the quick-disconnect hose coupling to an outlet of the fuel regulator system.

26. (Original) The method of claim 19, further comprising providing gasoline in a liquid fuel tank as the first fuel source and LPG in a pressurized fuel container as the second fuel source.

REMARKS

Claims 1-26 are pending in the present application. In the Office Action mailed August 3, 2017, the Examiner rejected claims 19-26 under 35 U.S.C. §112(b) or 35 U.S.C. §112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention. The Examiner next rejected claims 1-3, 7-10, 14-20, and 22-26 under 35 U.S.C. §102(a)(1) as being anticipated by Champion (Champion Power (2014, Dec. & Jan.) 100153 Manual, retrieved from http://www.championpowerequipment.com/media/2400/100153_manual-english_12-4-14.pdf. Claims 1-3, 7-10, and 14-18 were rejected on the ground of nonstatutory double patenting as being unpatentable over claim 1 of U.S. Patent No. 9,435,273.

Claims 4-6 and 11-13 were indicated as containing allowable subject matter. Such indication is appreciated.

Rejection under 35 U.S.C. §112(b) or 35 U.S.C. §112 (pre-AIA), second paragraph

The Examiner rejected claims 19-26 under 35 U.S.C. §112(b) or 35 U.S.C. §112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

In setting forth the rejection, the Examiner asserted that "[c]laims 19-26 provides for the use of a mechanical fuel switch on an internal combustion engine, but, since the claim does not set forth any steps involved in the method process of assembling the engine as is set forth as the claim objective, it is unclear what method/process applicant is intending to encompass." *Office Action*, August 3, 2017, p. 2. Applicant respectfully disagrees with the rejection.

According to MPEP §2173.02, "[i]n reviewing a claim for compliance with 35 U.S.C. 112, second paragraph, the examiner must consider the claim as a whole to determine whether the claim apprises one of ordinary skill in the art of its scope and, therefore, serves the notice function required by 35 U.S.C. 112, second paragraph." *MPEP §2173.02*. That is, "[a] decision on whether a claim is indefinite under 35 U.S.C. 112(b) or pre-AIA 35 U.S.C. 112, second paragraph requires a determination of whether those skilled in the art would understand what is claimed when the claim is read in light of the specification." *Id.* MPEP §2173.02 further states that the Examiner "should allow claims which define the patentable subject matter with a reasonable degree of particularity and distinctness," and that "[s]ome latitude in the manner of expression and the aptness of terms should be permitted." *Id.* The standard for compliance with

the definiteness requirement of 35 U.S.C. 112(b) "is whether the claim meets the threshold requirements of clarity and precision set forth in the statute, not whether more suitable language or modes of expression are available." *Id*.

Claim 19 calls for "[a] *method of assembling a mechanical fuel lockout switch* for an internal combustion engine," with the claim then setting forth steps for providing such an assembly of a mechanical fuel lockout switch. The claimed steps include "coupling a mechanical fuel valve to the internal combustion engine" and "coupling a fuel lockout apparatus to the mechanical fuel valve." That claim 19 does not also set forth "any steps involved in the method/process of assembling the engine," as asserted by the Examiner, is immaterial as to whether the claim is definite under 35 U.S.C. §112, second paragraph, as the claim makes clear that the claimed method is one of "*assembling a mechanical fuel lockout switch* for an internal combustion engine," and not of assembling an internal combustion engine itself. As claim 19 calls for a step of "providing an internal combustion engine" and then calls for detailed steps of "coupling a mechanical fuel valve to the internal combustion engine" and "coupling a fuel lockout apparatus to the mechanical fuel valve," Applicant believes that those skilled in the art would understand what is called for in claim 19 and that claim 19 meets the threshold requirements of clarity and precision, such that claim 19 is definite under 35 U.S.C. §112, second paragraph.

In light of at least the above, Applicant contends that claim 19 and all claims depending therefrom are definite, and therefore respectfully requests withdrawal of the rejection of claims 19-26 under 35 U.S.C. §112, second paragraph.

Rejection under 35 U.S.C. §102(a)(1) as being anticipated by Champion 100153 Manual

Claims 1, 9, and 19

The Examiner rejected claims 1-3, 7-10, 14-20, and 22-26 - including independent claims 1, 9, and 19 - under 35 U.S.C. §102(a)(1) as being anticipated by Champion (Champion Power (2014, Dec. & Jan.) 100153 Manual.

In setting forth a collective rejection of claims 1-3, 7-10, 14-20, and 22-26, the Examiner asserted that:

> Regarding claims 1-3, 7-10, 14-20, and 22-26, the manual of Champion clearly anticipates the entirety of the claim limitations. The manual discloses a dual fuel generator internal combustion engine (Title page) which makes use [of] a fuel selector switch and valves (shown in picture on title page and elaborated upon through the text) to selectively allow gasoline or propane into the engine,

> the propane being using a hose and passing through two regulators, one on the line and one within as per part #102 and the "fuel metering system" regulator disclosed on the last page.

Office Action, supra at 3. Applicant respectfully disagrees with the rejection and believes each of independent claims 1, 9, and 19 to be patentably distinct from that which is disclosed in Champion. That is, Champion does not anticipate that which is called for in independent claims 1, 9, and 19, as anticipation under pre-AIA 35 U.S.C. §102(a)(1) requires that "[t]he identical invention must be shown [in the reference] in as complete detail as is contained in the ... claim." *MPEP §2131* (citing *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989)). As will be set forth in detail here below, Champion does not disclose each and every element of any of independent claims 1, 9, and 19 and thus does not anticipate the claims, as "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *MPEP §2131* (citing *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631 (Fed. Cir. 1987)).

Initially, Applicant believes that the present rejection of independent claims 1, 9, and 19 (and more generally all of claims 1-3, 7-10, 14-20, and 22-26), on its face, is deficient. According to MPEP § 706, "[t]he goal of examination is to clearly articulate any rejection early in the prosecution process so that the Applicant has the opportunity to provide evidence of patentability and otherwise reply completely at the earliest opportunity." *MPEP* §706. With respect to the rejection of the pending claims, the Examiner merely made blanket statements that Champion discloses the claimed elements, without giving any indication where the elements were allegedly taught in Champion. *See Office Action*, supra at 3. That is, the Examiner has not indicated "the relevant teachings of the prior art relied upon, preferably with reference to the relevant column or page number(s) and line number(s) where appropriate," as required under MPEP §706.02(j). Accordingly, the Examiner has not "clearly articulate[d]" the rejection of any of claims 1-3, 7-10, 14-20, and 22-26, and the rejection is therefore believed to be deficient.

Regardless of the above, Applicant believes the rejection of at least of independent claims 1, 9, and 19 to be unsustainable. Specifically, Applicant believes that Champion does not teach or disclose that which is called for in independent claims 1, 9, and 19.

Claim 1 calls for a mechanical fuel lockout switch for a dual fuel engine provides for the selection of a desired fuel to operate the engine. The mechanical fuel lockout switch includes a mechanical fuel valve and a fuel lockout apparatus. The mechanical fuel valve actuates between a first position and a second position to selectively control fuel flow to the dual fuel engine from a

first fuel source through a first fuel line and a second fuel source through a second fuel line. The fuel lockout apparatus couples to the mechanical fuel valve ensuring individual communication of the fuel sources to the engine. The mechanical fuel lockout switch communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position.

Claim 9 calls for a dual fuel generator and fuel delivery system includes 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 and fuel delivery system also includes a fuel regulator system located off board the dual fuel generator to control the pressure of fuel from the pressurized fuel source and deliver the fuel at a desired pressure for operation of the generator. The fuel regulator system includes 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. The fuel regulator system also includes 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. The dual fuel generator and fuel delivery system further includes a mechanical fuel valve actuateable 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.

Claim 19 calls for a method of assembling a mechanical fuel lockout switch for an internal combustion engine includes providing an internal combustion engine configured to operate on a fuel from a first fuel source and a different fuel from a second fuel source. The method also includes coupling a mechanical fuel valve to the internal combustion engine actuateable between a first position and a second position to selectively control fuel flow to the internal combustion engine from the first fuel source through a first fuel line and the second fuel source through a second fuel line. The method further includes coupling a fuel lockout apparatus to the mechanical fuel valve. When the mechanical fuel valve is in the first position, the fuel lockout apparatus communicates the first fuel source to the internal combustion engine and prevents the second fuel source from coupling to the internal combustion engine, and actuation of the mechanical fuel valve to the second position causes the fuel lockout apparatus to permit the

second fuel source to couple to the internal combustion engine, and interrupts the first fuel source communication with the internal combustion engine.

Based on a reading of Champion, the reference discloses a dual fuel generator that "is a gasoline or LPG engine driven, alternating current (AC) generator. *See Champion*, Title page and p. 1. The generator includes a fuel selector switch, identified as component (10) on p. 6 of Champion and the drawing included thereon. *See Champion*, p. 6. The fuel selector switch is described as being "on the front panel of the generator… to choose between the fuel source desired, Gas or LPG," and "[t]o select a fuel source simply slide the switch cover to either the right or left, and this will uncover the fuel valve of the fuel selected, [where] the LPG fuel valve (A) is to the left of the switch cover [and] the gas fuel valve (B) is to the right of the switch cover." *Id.* at 14. "Once a fuel source has been selected, the user must turn the fuel valve to the vertical position to open the fuel valve (1)" and "[t]o turn a fuel valve to the off position the valve must be in the horizontal position (2)." *Id.* "The fuel selector switch cover is specifically designed not to slide to either side while a specific fuel has been selected and the valve is in the "ON" position [but] only when the fuel valves are in the "OFF" position can the cover slide side to side." *Id.*

However, Champion does not disclose that which is specifically called for in each of claims 1, 9, and 19 and does not anticipate those claims, as Champion does not expressly or inherently describe each and every element set forth therein, as required for anticipation under 35 U.S.C. §102(a)(1).

Claim 1 is distinct over Champion at least for the reason(s) that Champion does not disclose a mechanical fuel lockout switch for a dual fuel engine that includes "a mechanical fuel valve [that] actuates between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line" and/or "a fuel lockout apparatus couple[d] to the mechanical fuel valve ensuring individual communication of the fuel sources to the engine." First, Champion discloses separate valves for the separate fuel sources – LPG fuel valve (A) and gas fuel valve (B), *see Champion*, p. 14, but not a single mechanical fuel valve that *actuates between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line*, as called for in claim 1. Second, Champion only discloses that the selector switch cover slides horizontal back and forth to selectively cover one of the LPG fuel valve (A) and gas fuel valve (B), but not that the switch cover is *coupled to* either of the fuel valves, as called for in claim 1 "a fuel lockout

apparatus couple[d] to the mechanical fuel valve"). Accordingly, Champion does not anticipate claim 1 under 35 U.S.C. §102(a)(1).

Claim 9 is distinct over Champion at least for the reason(s) that Champion does not disclose a dual fuel generator and fuel delivery system that includes "a fuel regulator system located off board the dual fuel generator [and having]… a primary pressure regulator coupled to a service valve of the pressurized fuel source and 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," nor does Champion disclose "a mechanical fuel valve actuateable 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." First, Champion only discloses use of a "LPG Hose with Regulator," *see Champion*, p. 8, but provides no teaching of a fuel regulator system located off board the dual fuel generator and having a primary pressure regulator and separate secondary pressure regulator, as called for in claim 9. Second, Champion discloses separate valves for the separate fuel sources – LPG fuel valve (A) and gas fuel valve (B), *see Champion*, p. 14, but not a mechanical fuel valve *actuateable 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*, as called for in claim 9. Accordingly, Champion does not anticipate claim 9 under 35 U.S.C. §102(a)(1).

Claim 19 is distinct over Champion at least for the reason(s) that Champion does not disclose a method that includes "coupling a mechanical fuel valve to the internal combustion engine actuateable between a first position and a second position to selectively control fuel flow to the internal combustion engine from the first fuel source through a first fuel line and the second fuel source through a second fuel line" and "coupling a fuel lockout apparatus to the mechanical fuel valve." First, Champion discloses separate valves for the separate fuel sources – LPG fuel valve (A) and gas fuel valve (B), *see Champion*, p. 14, but not a single mechanical fuel valve that is *actuateable between a first position and a second position to selectively control fuel flow to the internal combustion engine from the first fuel source through a first fuel line and the second fuel source through a second fuel line*, as called for in claim 19. Second, Champion only discloses that the selector switch cover slides horizontal back and forth to selectively cover one of the LPG fuel valve (A) and gas fuel valve (B), but not a step of *coupling* the switch cover to either of the LPG or gas fuel valve, as called for in claim 19, nor does Champion disclose that the selector

switch would communicate the first fuel source to the internal combustion engine and prevent the second fuel source from coupling to the internal combustion engine when in the first position and cause the fuel lockout apparatus to permit the second fuel source to couple to the internal combustion engine and interrupt the first fuel source communication with the internal combustion engine when in the second position, as further called for in claim 19.

For at least the reasons set forth above, Champion does not anticipate any of claims 1, 9, or 19 under 35 U.S.C. §102(a)(1) since, according to MPEP §2131, "to anticipate a claim, the reference must teach every element of the claim." Appellant therefore respectfully requests withdrawal of the rejection of claims 1, 9, and 19, along with the rejection of all claims depending therefrom.

Double Patenting Rejection

The Examiner rejected claims 1-3, 7-10, and 14-18 on the ground of nonstatutory double patenting as being unpatentable over claim 1 of U.S. Patent No. 9,435,273 (hereinafter the "273 patent"), with the Examiner asserting that "the limitations of claims 1-3, 7-10, and 14-18 are disclosed by the limitations of claim 1 except a detachable hose and two regulators for the transfer of one fuel." *Office Action*, supra at 5. The Examiner then further stated that "examiner takes official notice that it would have been obvious to one of ordinary skill in the art before the filing date of the invention to modify a dual fuel generator to include a fuel hose that can couple to and from the engine and two regulators to regulate the incoming pressure to the engine as these parts are not only routinely used in such a case but also are known to improve the fueling characteristics of the engine." *Id.* Applicant respectfully disagrees with the rejection.

First, Applicant believes that Examiner's application of Official Notice in rejecting claims 1-3, 7-10, and 14-18 is inappropriate under the Manual Patent Examining Procedure (MPEP). "The Examiner may take Official Notice of facts outside of the record which are capable of instant and unquestionable demonstration as being 'well-known' in the art." *MPEP §2144.03*. However, MPEP §2144.03 is clear that "such rejections [relying on official notice] should be judiciously applied," be "rare," and be used "[i]n limited circumstances." *Id.* Furthermore, "any facts so noticed should be of notorious character and serve only to 'fill in the gaps' in an insubstantial manner which might exist in the evidentiary showing made by the Examiner to support a particular ground for rejection." *Id.* Applicant does not believe that the Examiner's use of Official Notice is merely to "fill in the gaps." That is, in as much as Applicant can gather from the limited statements/rationale set forth by the Examiner, it appears that the Examiner has taken

Official Notice of entire elements of the claims, thereby effectively attempting to teach substantial claim limitations, rather than simply "fill in the gaps." Thus, the use of Official Notice is hereby traversed. The Examiner must "cite a reference in support of his or her position" should the Applicant traverse the assertion. *Id*.

Regardless of the above, Applicant believes that the double patenting rejection is improper. MPEP §804(II)(B)(1) states that any obviousness-type double patenting rejection should make clear:

(A) The differences between the inventions defined by the conflicting claims - a claim in the patent compared to a claim in the application; and
(B) The reasons why a person of ordinary skill in the art would conclude that the invention defined in the claim at issue would have been an obvious variation of the invention defined in a claim in the patent. *Id.* (emphasis added).

The Examiner's double patenting rejection of claims 1-3, 7-10, and 14-18 does not satisfy either of the requirements set forth in section (A) or section (B) of MPEP §804(II)(B)(1). Referring first to section (A), MPEP §804 requires a double patenting rejection make clear a **claim-to-claim** comparison between the referenced patent and the rejected claims. The Examiner's rejection does not include any claim-to-claim comparison between the present application and the '273 patent. Instead, the Examiner relies on a generalized statement that "the limitations of claims 1-3, 7-10, and 14-18 are disclosed by the limitations of claim 1 except a detachable hose and two regulators for the transfer of one fuel" and a general reference to "official notice." Since the Examiner's rejection relies on a comparison of a merely generalized referenced to the entirety of claims 1-3, 7-10, and 14-18 to claim 1 of the '273 patent , rather than a **claim-to-claim** comparison, the rejection does not meet the requirements of MPEP §804 on its face. In order to satisfy the claim-to-claim comparison required by MPEP §804, the Examiner must make clear the differences between each of the claims of the present application and claim 1 of the '273 patent. The Examiner has not provided any such analysis to date, and therefore has not properly established the grounds required in section (A) of MPEP §804 for an obviousness-type double patenting rejection.

The Examiner also has not satisfied the requirements set forth in section (B) of MPEP §804 for establishing an obviousness-type double patenting rejection. Namely, the Examiner has not provided any reasoning as to why a person of ordinary skill in the art would conclude that

the invention defined in any of claims 1-3, 7-10, and 14-18 is an obvious variant of the invention defined in claim 1 of the '273 Patent. Again, the Examiner's rejection focuses solely on a generalized description of the invention as a whole (i.e., the collection of claims 1-3, 7-10, and 14-18) and does not specifically reference any of the claims of the present application or any of the claim elements specifically called for in claim 1 of the '273 patent. As such, the rejection of claims 1-3, 7-10, and 14-18does not establish a reasoned comparison tied to the actual claims of the present application and does not satisfy the requirements of section (B) of MPEP §804.

In summary, nowhere has the Examiner identified the reasons why any of claims 1-3, 7-10, and 14-18 of the present application are obvious variants of the invention called for in claim 1 of the '273 patent. As such, the Examiner has not provided basis for the assertion that claims 1-3, 7-10, and 14-18 are not patentably distinct from claim 1 of the '273 patent as required to support a non-statutory double patenting rejection under 35 U.S.C. §101.

Notwithstanding the deficiencies in the rejection, Applicant further submits that the nonstatutory obviousness-type double patenting rejections should be withdrawn because the claims of the present application are patentably distinct from claim 1 of the '273 Patent. According to MPEP §804, in situations where as here the application under examination is the later-filed application, a nonstatutory obviousness-type double patenting rejection is appropriate where "the invention claimed in the application would have been anticipated by, or an obvious variation of, the invention claimed in the patent." *MPEP* §804.

In light of at least the above, Applicant respectfully asserts that the inventions claimed in the present application are **not** anticipated by, or an obvious variation of, the invention of claim 1 of the '273 patent, when taken alone or in combination with official notice. Applicant therefore believes the double patenting rejection to be improper and respectfully requests the withdrawal of the rejection of claims 1-3, 7-10, and 14-18 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 1 of the '273 patent.

Conclusion

Therefore, in light of at least the foregoing, Applicant respectfully believes that the present application is in condition for allowance. As a result, Applicant respectfully requests timely issuance of a Notice of Allowance for claims 1-26.

Applicant appreciates the Examiner's consideration of these Remarks and cordially invites the Examiner to call the undersigned, should the Examiner consider any matters unresolved.

Respectfully submitted,

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Dated: November 3, 2017
Attorney Docket No.: CET1090.019

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General Authorization and Extension of Time

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 50-2623. Should no proper payment be enclosed herewith, as by credit card authorization being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 50-2623. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extensions under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 50-2623. Please consider this a general authorization to charge any fee that is due in this case, if not otherwise timely paid, to Deposit Account No. 50-2623.

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Attorney Docket No.: CET1090.019

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Electronic Acknowledgement Receipt

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Application Number:	14738060
International Application Number:	
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Title of Invention:	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE
First Named Inventor/Applicant Name:	Mark J. Sarder
Customer Number:	26629
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Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Response.pdf	196263 aaa465e2c894c76db34e4858cbcf1bf0d382ed23	yes	18

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	7
	Applicant Arguments/Remarks Made in an Amendment	8	18
Warnings:			
Information:			
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New International Application Filed with the USPTO as a Receiving Office
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 14/738,060	Filing Date 06/12/2015	☐ To be Mailed

ENTITY: ☐ LARGE ☒ SMALL ☐ MICRO

APPLICATION AS FILED – PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	RATE ($)	FEE ($)
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
☐ SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
☐ EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X $ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X $ =	
☐ APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

AMENDMENT	11/03/2017	(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	* 26	Minus	** 26	= 0	X $40 =	0
	Independent (37 CFR 1.16(h))	* 3	Minus	***3	= 0	X $210 =	0
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	**0**

AMENDMENT		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	RATE ($)	ADDITIONAL FEE ($)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X $ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X $ =	
	☐ Application Size Fee (37 CFR 1.16(s))						
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

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EXAMINER
LATHERS, KEVIN ANTHONY

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NOTIFICATION DATE	DELIVERY MODE
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The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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PTOL-90A (Rev. 04/07)

Office Action Summary	Application No. 14/738,060	Applicant(s) SARDER ET AL.	
	Examiner KEVIN A. LATHERS	Art Unit 3747	AIA (First Inventor to File) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTHS FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06/12/2015*.

☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

4)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims*

5)☒ Claim(s) *1-26* is/are pending in the application.

5a) Of the above claim(s) _____ is/are withdrawn from consideration.

6)☐ Claim(s) _____ is/are allowed.

7)☒ Claim(s) *1-3,7-10 and 14-26* is/are rejected.

8)☒ Claim(s) *4-6 and 11-13* is/are objected to.

9)☐ Claim(s) _____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

10)☐ The specification is objected to by the Examiner.

11)☒ The drawing(s) filed on *06/12/2015* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

a)☐ All b)☐ Some** c)☐ None of the:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

** See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Information Disclosure Statement(s) (PTO/SB/08a and/or PTO/SB/08b) Paper No(s)/Mail Date _____.

3) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

4) ☒ Other: *NPL*.

DETAILED ACTION

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Claim Rejections - 35 USC § 112

1. The following is a quotation of 35 U.S.C. 112(b):
(b) CONCLUSION.—The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor or a joint inventor regards as the invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 19-26 are rejected under 35 U.S.C. 112(b) or 35 U.S.C. 112 (pre-AIA), second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the inventor or a joint inventor, or for pre-AIA the applicant regards as the invention.

3. Claims 19-26 provides for the use of a mechanical fuel switch on an internal combustion engine, but, since the claim does not set forth any steps involved in the method/process of assembling the engine as is set forth as the claim objective, it is unclear what method/process applicant is intending to encompass. This makes t

Claim Rejections - 35 USC § 102

4. In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

> (a)(1) the claimed invention was patented, described in a printed publication, or in public use, on sale or otherwise available to the public before the effective filing date of the claimed invention.

5. Claim(s) 1-3, 7-10, 14-20, and 22-26 is/are rejected under 35 U.S.C. 102(a)(1) as being clearly anticipated by Champion (Champion Power (2014, Dec. & Jan.). 100153 Manual. Retrieved from http://www.championpowerequipment.com/media/2400/100153_manual-english_12-4-14.pdf).

6. **Regarding claims 1-3, 7-10, 14-20, and 22-26,** the manual of Champion clearly anticipates the entirety of the claim limitations. The manual discloses a dual fuel generator internal combustion engine (Title page) which makes use a fuel selector switch and valves (shown in picture on title page and elaborated upon through the text) to selectively allow gasoline or propane into the engine, the propane being using a hose couple and passing through two regulators, one on the line and one within as per part #102 and the "fuel metering system" regulator disclosed on the last page.

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have

been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on nonstatutory double patenting provided the reference application or patent either is shown to be commonly owned with the examined application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement. See MPEP § 717.02 for applications subject to examination under the first inventor to file provisions of the AIA as explained in MPEP § 2159. See MPEP §§ 706.02(l)(1) - 706.02(l)(3) for applications not subject to examination under the first inventor to file provisions of the AIA. A terminal disclaimer must be signed in compliance with 37 CFR 1.321(b).

The USPTO Internet website contains terminal disclaimer forms which may be used. Please visit www.uspto.gov/patent/patents-forms. The filing date of the application in which the form is filed determines what form (e.g., PTO/SB/25, PTO/SB/26, PTO/AIA/25, or PTO/AIA/26) should be used. A web-based eTerminal Disclaimer may be filled out completely online using web-screens. An eTerminal Disclaimer that meets all requirements is auto-processed and approved immediately upon submission. For

more information about eTerminal Disclaimers, refer to www.uspto.gov/patents/process/file/efs/guidance/eTD-info-I.jsp.

8. Claims 1-3, 7-10, and 14-18 rejected on the ground of nonstatutory double patenting as being unpatentable over claim 1 of U.S. Patent No. 9,435,273. Although the claims at issue are not identical, they are not patentably distinct from each other because the limitations of claims 1-3, 7-10, and 14-18 are disclosed by the limitations of claim 1 except a detachable hose and two regulators for the transfer of one fuel. However, examiner takes official notice that it would have been obvious to one of ordinary skill in the art before the filing date of the invention to modify a dual fuel generator to include a fuel hose that can couple to and from the engine and two regulators to regulate the incoming pressure to the engine as these parts are not only routinely used in such a case but also are known to improve the fueling characteristics of the engine.

Allowable Subject Matter

9. Claims 4-6 and 11-13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter: The closest prior art fails to disclose or make obvious the use of a dual fuel lockout switch on a dual fuel internal combustion engine wherein when the lockout switch is in one position it prevents the fuel source from coupling to the fuel system *lines* of the engine.

11. Champion discloses a dual fuel system as discussed above, but its lockout switch does not prevent the hose of the propane tank from even coupling to the engine fuel system lines.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Monros (US 2014/0202430) discloses an engine which makes use of a gasoline supply 16 and a propane supply 18 which uses a selector switch and valve 20 to allow one or the other of the fuels to the engine (Fig. 1, shown). Stoltman (US 4,463,735) discloses an engine which makes use of a two fuels, a liquid and gaseous, which are metered by a fuel selection valve according to the pressure of the system (Fig. 1, shown).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEVIN A. LATHERS whose telephone number is (571)272-1050. The examiner can normally be reached on 10:00 am-7:00 pm EST, Monday to Thursday.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lindsay Low can be reached on 571-272-1196. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KEVIN A LATHERS/
Examiner, Art Unit 3747

Notice of References Cited	Application/Control No. 14/738,060	Applicant(s)/Patent Under Reexamination SARDER ET AL.	
	Examiner KEVIN A. LATHERS	Art Unit 3747	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	CPC Classification	US Classification
*	A	US-2014/0202430 A1	07-2014	Monros; Serge V.	F02D19/0615	123/445
*	B	US-9,435,273 B2	09-2016	Sarder; Mark J.		1/1
*	C	US-4,463,735	08-1984	Stoltman		123/525
	D	US-				
	E	US-				
	F	US-				
	G	US-				
	H	US-				
	I	US-				
	J	US-				
	K	US-				
	L	US-				
	M	US-				

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Champion Power (2014, Dec. & jan.). 100153 Manul. Retrieved from http://www.championpowerequipment.com/media/2400/100153_manual-english_12-4-14.pdf
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

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BIB DATA SHEET

CONFIRMATION NO. 9670

SERIAL NUMBER	FILING or 371(c) DATE	CLASS	GROUP ART UNIT	ATTORNEY DOCKET NO.
14/738,060	06/12/2015 RULE	123	3747	CET1090.019

APPLICANTS
Champion Engine Technology, LLC, Sussex, WI;

INVENTORS
Mark J. Sarder, Waukesha, WI;
Aleko D. Sotiriades, Cedarburg, WI;
James J. Dehn, Brookfield, WI;
Leigh Jenison, Hartland, WI;

** **CONTINUING DATA** **********

** **FOREIGN APPLICATIONS** **********

** **IF REQUIRED, FOREIGN FILING LICENSE GRANTED** ** SMALL ENTITY **
06/22/2015

Foreign Priority claimed	35 USC 119(a-d) conditions met	Verified and Acknowledged	Met after Allowance	STATE OR COUNTRY	SHEETS DRAWINGS	TOTAL CLAIMS	INDEPENDENT CLAIMS
☐ Yes ☑ No	☐ Yes ☐ No	/KEVIN ANTHONY LATHERS/ Examiner's Signature	☐ Initials	WI	5	26	3

ADDRESS

ZIOLKOWSKI PATENT SOLUTIONS GROUP, SC (ZPS)
136 S WISCONSIN ST
PORT WASHINGTON, WI 53074
UNITED STATES

TITLE

DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE

FILING FEE RECEIVED	FEES: Authority has been given in Paper	
970	No._____ to charge/credit DEPOSIT ACCOUNT No._____ for following:	☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit

BIB (Rev. 05/07).

Search Notes	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14738060	SARDER ET AL.
	Examiner	Art Unit
	KEVIN A LATHERS	3747

CPC- SEARCHED		
Symbol	Date	Examiner
F02D19/0613, 16/0605, 19/0647	07/28/2017	/K.L./
Y02T10/36	07/28/2017	/K.L./

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner

* See search history printout included with this form or the SEARCH NOTES box below to determine the scope of the search.

SEARCH NOTES		
Search Notes	Date	Examiner
EAST including inventor and assignee search.	07/28/2017	/K.L./
Google key word search (e.g. "dual fuel generator").	07/28/2017	/K.L./

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner

Index of Claims	Application/Control No.	Applicant(s)/Patent Under Reexamination
	14738060	SARDER ET AL.
	Examiner	**Art Unit**
	KEVIN A LATHERS	3747

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

CLAIM		DATE								
Final	Original	07/28/2017								
	1	✓								
	2	✓								
	3	✓								
	4	O								
	5	O								
	6	O								
	7	✓								
	8	✓								
	9	✓								
	10	✓								
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	21	✓								
	22	✓								
	23	✓								
	24	✓								
	25	✓								
	26	✓								

Doc code: IDS
Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (01-10)
Approved for use through 07/31/2012. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99**)		
	Application Number	
	Filing Date	
	First Named Inventor	Mark J. Sarder et al.
	Art Unit	
	Examiner Name	
	Attorney Docket Number	CET1090.019

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	4502453		1985-03-05	Kabasin et al.	
	2	5171487		1992-12-15	Hudz	
	3	5320078		1994-06-14	Lorraine	
	4	5450832		1995-09-19	Graf	
	5	5673670		1997-10-07	Powell et al.	
	6	6223730	B1	2001-05-01	Hasegawa et al.	
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	Mark J. Sarder et al.
	Art Unit	
	Examiner Name	
	Attorney Docket Number	CET1090.019

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	1							☐

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		☐

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EXAMINER SIGNATURE

Examiner Signature	/KEVIN A LATHERS/	Date Considered	05/03/2017

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /K.A.L/

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	Mark J. Sarder et al.
	Art Unit	
	Examiner Name	
	Attorney Docket Number	CET1090.019

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Timothy J. Ziolkowski/	Date (YYYY-MM-DD)	2015-06-12
Name/Print	Timothy J. Ziolkowski	Registration Number	38368

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /K.A.L/

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L3	5	"9435273"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/28 14:35
S1	445	F02D19/0613.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:25
S2	1204	F02D19/0605.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:25
S3	3408	F02D19/0647.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:25
S4	15258	Y02T10/36.cpc.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:25
S5	808	(S1 S2 S3 S4) and (switch valve) near20 (propane natural adj gas gaseous lng cng) near20 (gasoline liquid diesel)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:28
S6	79	(S1 S2 S3 S4) and (switch valve) near20 (propane natural adj gas gaseous lng cng) near20 (gasoline liquid diesel) and (second secondary auxiliary) near5 (regulat$3)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:29
S7	64	(S1 S2 S3 S4) and (switch valve) near20	US-PGPUB;	OR	OFF	2017/07/27

		(propane natural adj gas gaseous lng cng) near20 (gasoline liquid diesel) and (second secondary auxiliary) adj (regulat$3 pressure)	USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB			14:44
S8	28	("5450832" | "20130220274" | "5325835" | "5320078" | "4619240" | "6082323" | "6453877" | "5171487" | "6223730" | "6213083" | "4489699" | "5287839" | "8590510" | "5673670" | "4450821" | "5816224" | "6276345" | "4502453" | "20130047964" | "4372276" | "6401685" | "7905469" | "2722208" | "4895124" | "5161496" | "5379740" | "5438968" | "5419291" | "6914342" | "8342158").PN.	USPAT	OR	OFF	2017/07/27 14:45
S9	124	("5450832" | "20130220274" | "5325835" | "5320078" | "4619240" | "6082323" | "6453877" | "5171487" | "6223730" | "6213083" | "4489699" | "5287839" | "8590510" | "5673670" | "4450821" | "5816224" | "6276345" | "4502453" | "20130047964" | "4372276" | "6401685" | "7905469" | "2722208" | "4895124" | "5161496" | "5379740" | "5438968" | "5419291" | "6914342" | "8342158").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:45
S10	421	(duel dual) near5 fuel near20 (engine generator) same (switch valve) near20 between	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 14:46
S11	0	dual adj fuel near20 engine same "switchover valve"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 15:17
S12	44	dual adj fuel near20 engine same (switch switchover) near5 valve	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 15:19
S13	49	"6591817"	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 15:19
S14	63	("3799125" | "4150645" | "4265208" | "4303049" | "4305350" | "4323046" | "4353345" | "4391251" | "4398517" | "4524033" | "4671243" | "5450832" | "5524582" | "5623907" | "5720266" | "5816224" | "6035837").PN. OR ("6591817").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 15:20

S15	80	dual adj fuel near20 engine same (switch switchover select$3) near5 valve	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/27 15:21
S16	30	(("SARDER") near3 ("Mark")).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 15:25
S17	28	(("SOTIRIADES") near3 ("Aleko")).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 15:25
S18	41	(("DEHN") near3 ("James")).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 15:25
S19	15	(("JENISON") near3 ("Leigh")).INV.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 15:25
S20	16	(("CHAMPION") near3 ("ENGINE") near3 ("TECHNOLOGY") near3 ("LLC")).AANM.	USPAT	OR	OFF	2017/07/27 15:25
S21	19	(("CHAMPION") near3 ("ENGINE") near3 ("TECHNOLOGY") near3 ("LLC")).as.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 15:26
S22	5	("20040240141" | "20060169238" | "20130098349" | "20130122439" | "4489699").PN. OR ("9435273").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 15:42
S23	41	("1973142" | "2315882" | "2381304" | "4068639" | "4227497" | "4335697").PN. OR ("4489699").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 15:43
S24	97	(dual multi multiple plural plurality) adj fuel near20 engine same (switch switchover changeover change switch$3) near5 (valve switch)	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 16:02
S25	1	(09/813622).APP.	USPAT; USOCR	OR	OFF	2017/07/27 16:03
S26	63	("3799125" | "4150645" | "4265208" | "4303049" | "4305350" | "4323046" | "4353345" | "4391251" | "4398517" | "4524033" | "4671243" | "5450832" | "5524582" | "5623907" | "5720266" | "5816224" | "6035837").PN. OR ("6591817").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 16:03
S27	64	("4335697" | "4393848" | "4430978" | "4606322" | "4683864" | "4825842" | "4922862" | "5379740" | "5474047" | "5479906" | "5755211" | "5775282").PN. OR ("6035837").URPN.	US-PGPUB; USPAT; USOCR	OR	OFF	2017/07/27 16:34
S28	27	("5999888" | "6543395" | "4619240" | "20140366577" | "20120168023" | "20140202430" | "4463735" | "5668310" | "5224457").PN.	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/28 10:32
S29	0	(14/156204).APP.	USPAT; USOCR	OR	OFF	2017/07/28 11:33
S30	5	(gas gasoline liquid near5 fuel) near20	USPAT;	OR	OFF	2017/07/28

		(propane natural adj gas) near20 (fill$3 fueling) same (quick-connect connect$3) near20 (cover flange)	USOCR			11:47
S31	109	(gas gasoline liquid near5 fuel) near20 (propane natural adj gas) near20 (fill$3 fueling) same (quick-connect connect$3) near20 (cover flange)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/28 11:47
S32	280	(gas gasoline liquid near5 fuel) near20 (propane natural adj gas) near20 (fill$3 fueling) same (cover flange)	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/28 11:48
S33	171	(gas gasoline liquid near5 fuel) near20 (propane natural adj gas) near20 (fill$3 fueling) same (cover flange) not S31	US-PGPUB; USPAT; USOCR; FPRS; EPO; JPO; DERWENT; IBM_TDB	OR	OFF	2017/07/28 11:48

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	Application Number	14738060
	Filing Date	2015-06-12
	First Named Inventor	Mark J. Sarder et al.
	Art Unit	3747
	Examiner Name	
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	1	2722208		1955-11-01	Conroy, Jr. et al.	
	2	4372276		1983-02-08	Bernhardsson et al.	
	3	4450821		1984-05-29	Venning et al.	
	4	4489699		1984-12-25	Poehlman	
	5	4619240		1986-10-28	Bedford et al.	
	6	4895124		1990-01-23	Bartholomew	
	7	5287839		1994-02-22	Kondou et al.	
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	10	5438968		1995-08-08	Johnson et al.	
	11	5816224		1998-10-06	Welsh et al.	
	12	6082323		2000-07-04	Winberg	
	13	6213083	B1	2001-04-10	Winberg	
	14	6276345	B1	2001-08-21	Nelson et al.	
	15	6401685	B1	2002-06-11	Warner	
	16	6453877	B1	2002-09-24	Lucier et al.	
	17	6914342	B1	2005-07-05	French	
	18	7905469	B2	2011-03-15	Nickels et al.	
	19	8342158	B2	2013-01-01	Ulrey et al.	

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	20	8590510	B2	2013-11-26	Surnilla et al.	
	21	5161496		1992-11-10	Matsushima et al.	
	22	5325835		1994-07-05	Kimata et al.	

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	1	20130047964	A1	2013-02-28	Kim	
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	Examiner Name	
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	1	Honda EU20i LPG, March 20, 2012, https://www.youtube.com/watch?v=yBpq33aJmR0	☐
	2	JOHNSON et al., "Electronic Direct Fuel Injection (EDFI) for Small Two-Stroke Engines," SAE Technical Paper 1999-01-3312, Proceedings of the 1999 SAE Small Engine Technology Conference, Madison, WI, September 28-30, 1999, pp. 1-15	☐

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	Attorney Docket Number	CET1090.019

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☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

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A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Timothy J. Ziolkowski/	Date (YYYY-MM-DD)	2015-10-28
Name/Print	Timothy J. Ziolkowski	Registration Number	38368

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
14/738,060	06/12/2015	Mark J. Sarder	CET1090.019

CONFIRMATION NO. 9670

PUBLICATION NOTICE

26629
ZIOLKOWSKI PATENT SOLUTIONS GROUP, SC (ZPS)
136 S WISCONSIN ST
PORT WASHINGTON, WI 53074

OC00000008791424 9

Title:DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE

Publication No.US-2016-0363058-A1
Publication Date:12/15/2016

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	First Named Inventor	Mark J. Sarder et al.
	Art Unit	3747
	Examiner Name	
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	4	4489699		1984-12-25	Poehlman	
	5	4619240		1986-10-28	Bedford et al.	
	6	4895124		1990-01-23	Bartholomew	
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	12	6082323		2000-07-04	Winberg	
	13	6213083	B1	2001-04-10	Winberg	
	14	6276345	B1	2001-08-21	Nelson et al.	
	15	6401685	B1	2002-06-11	Warner	
	16	6453877	B1	2002-09-24	Lucier et al.	
	17	6914342	B1	2005-07-05	French	
	18	7905469	B2	2011-03-15	Nickels et al.	
	19	8342158	B2	2013-01-01	Ulrey et al.	

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	20	8590510	B2	2013-11-26	Surnilla et al.	
	21	5161496		1992-11-10	Matsushima et al.	
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EFS Web 2.1.17

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14738060
	Filing Date	2015-06-12
	First Named Inventor	Mark J. Sarder et al.
	Art Unit	3747
	Examiner Name	
	Attorney Docket Number	CET1090.019

	1	Honda EU20i LPG, March 20, 2012, https://www.youtube.com/watch?v=yBpq33aJmR0	☐
	2	JOHNSON et al., "Electronic Direct Fuel Injection (EDFI) for Small Two-Stroke Engines," SAE Technical Paper 1999-01-3312, Proceedings of the 1999 SAE Small Engine Technology Conference, Madison, WI, September 28-30, 1999, pp. 1-15	☐

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Examiner Signature		Date Considered	

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[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	14738060
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	First Named Inventor	Mark J. Sarder et al.
	Art Unit	3747
	Examiner Name	
	Attorney Docket Number	CET1090.019

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Timothy J. Ziolkowski/	Date (YYYY-MM-DD)	2015-10-28
Name/Print	Timothy J. Ziolkowski	Registration Number	38368

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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Electronic Acknowledgement Receipt	
EFS ID:	23918070
Application Number:	14738060
International Application Number:	
Confirmation Number:	9670
Title of Invention:	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE
First Named Inventor/Applicant Name:	Mark J. Sarder
Customer Number:	26629
Filer:	Timothy J. Ziolkowski/Robyn Templin
Filer Authorized By:	Timothy J. Ziolkowski
Attorney Docket Number:	CET1090.019
Receipt Date:	28-OCT-2015
Filing Date:	12-JUN-2015
Time Stamp:	15:18:21
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Information Disclosure Statement (IDS) Form (SB08)	SuppIDS.pdf	613139 57b2d0870564b237f705b1eca1adeb24f7abc744	no	6
Warnings:					
Information:					

2	Non Patent Literature	NPL1-HONDA_EU20i_LPG.pdf	15304933 ab3bddf9b920528fa110a17a5b7c5436961daabe	no	3
Warnings:					
Information:					
3	Non Patent Literature	NPL2-Johnson-Electronic_Direct_Fuel_Injection.pdf	414792 fb1a5b3aa5b1053ee0c5f24678e329b555464f3b	no	17
Warnings:					
Information:					
		Total Files Size (in bytes):	16332864		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

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If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

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If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office
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PATENT APPLICATION FEE DETERMINATION RECORD

Substitute for Form PTO-875

Application or Docket Number: 14/738,060

APPLICATION AS FILED - PART I

FOR	(Column 1) NUMBER FILED	(Column 2) NUMBER EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY FEE($)
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	70		N/A	
SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	300		N/A	
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	360		N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	26 minus 20 =	* 6	x 40 =	240	OR		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	3 minus 3 =	*	x 210 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is $310 ($155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	970		TOTAL	

APPLICATION AS AMENDED - PART II

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT A	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

		(Column 1) CLAIMS REMAINING AFTER AMENDMENT		(Column 2) HIGHEST NUMBER PREVIOUSLY PAID FOR	(Column 3) PRESENT EXTRA	SMALL ENTITY RATE($)	SMALL ENTITY ADDITIONAL FEE($)	OR	OTHER THAN SMALL ENTITY RATE($)	OTHER THAN SMALL ENTITY ADDITIONAL FEE($)
AMENDMENT B	Total (37 CFR 1.16(i))	*	Minus	**	=	x =		OR	x =	
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x =		OR	x =	
	Application Size Fee (37 CFR 1.16(s))									
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".
*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".
The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.

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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY.DOCKET.NO	TOT CLAIMS	IND CLAIMS
14/738,060	06/12/2015	3747	970	CET1090.019	26	3

CONFIRMATION NO. 9670

26629
ZIOLKOWSKI PATENT SOLUTIONS GROUP, SC (ZPS)
136 S WISCONSIN ST
PORT WASHINGTON, WI 53074

FILING RECEIPT

OC000000075883212

Date Mailed: 06/24/2015

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Mark J. Sarder, Waukesha, WI;
Aleko D. Sotiriades, Cedarburg, WI;
James J. Dehn, Brookfield, WI;
Leigh Jenison, Hartland, WI;

Applicant(s)

Champion Engine Technology, LLC, Sussex, WI;

Power of Attorney: The patent practitioners associated with Customer Number 26629

Domestic Applications for which benefit is claimed - None.
A proper domestic benefit claim must be provided in an Application Data Sheet in order to constitute a claim for domestic benefit. See 37 CFR 1.76 and 1.78.

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see http://www.uspto.gov for more information.) - None.
Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access - A proper **Authorization to Permit Access to Application by Participating Offices** (PTO/SB/39 or its equivalent) has been received by the USPTO.

If Required, Foreign Filing License Granted: 06/22/2015
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 14/738,060**
Projected Publication Date: 12/15/2016

Non-Publication Request: No

Early Publication Request: No
**** SMALL ENTITY ****
Title

DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE

Preliminary Class

123

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

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Application Number	
Filing Date	
First Named Inventor	Mark J. Sarder
Title	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE
Art Unit	
Examiner Name	
Attorney Docket Number	CET1090.019

SIGNATURE of Applicant or Patent Practitioner

Signature	/Timothy J. Ziolkowski/	Date (Optional)	
Name	Timothy J. Ziolkowski	Registration Number	38368
Title (if Applicant is a juristic entity)	Patent Practitioner		
Applicant Name (if Applicant is a juristic entity)	Champion Engine Technology, LLC		

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4(d) for signature requirements and certifications. If more than one applicant, use multiple forms.

☑ *Total of 1 forms are submitted.

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I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number	Filing Date

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☑ I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above: 26629

OR

☐ I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:

☑ The address associated with the above-mentioned Customer Number

OR

☐ The address associated with Customer Number:

OR

	Firm or Individual Name				
Address					
City		State		Zip	
Country					
Telephone		Email			

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

☐ Inventor or Joint Inventor (title not required below)

☐ Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)

☑ Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)

☐ Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature		Date (Optional)	
Name	Dorrance J. Noonan		
Title	CEO, Champion Engine Technology, LLC		

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☑ Total of 1 forms are submitted.

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	
	Filing Date	
	First Named Inventor	Mark J. Sarder et al.
	Art Unit	
	Examiner Name	
	Attorney Docket Number	CET1090.019

U.S.PATENTS						Remove
Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	4502453		1985-03-05	Kabasin et al.	
	2	5171487		1992-12-15	Hudz	
	3	5320078		1994-06-14	Lorraine	
	4	5450832		1995-09-19	Graf	
	5	5673670		1997-10-07	Powell et al.	
	6	6223730	B1	2001-05-01	Hasegawa et al.	
If you wish to add additional U.S. Patent citation information please click the Add button.						Add
U.S.PATENT APPLICATION PUBLICATIONS						Remove
Examiner Initial*	Cite No	Publication Number	Kind Code[1]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99)		
	Application Number	
	Filing Date	
	First Named Inventor	Mark J. Sarder et al.
	Art Unit	
	Examiner Name	
	Attorney Docket Number	CET1090.019

	1					

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FOREIGN PATENT DOCUMENTS Remove

Examiner Initial*	Cite No	Foreign Document Number[3]	Country Code[2] ¡	Kind Code[4]	Publication Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear	T[5]
	1							☐

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NON-PATENT LITERATURE DOCUMENTS Remove

Examiner Initials*	Cite No	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc), date, pages(s), volume-issue number(s), publisher, city and/or country where published.	T[5]
	1		☐

If you wish to add additional non-patent literature document citation information please click the Add button Add

EXAMINER SIGNATURE

Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

INFORMATION DISCLOSURE STATEMENT BY APPLICANT (**Not for submission under 37 CFR 1.99)**		
	Application Number	
	Filing Date	
	First Named Inventor	Mark J. Sarder et al.
	Art Unit	
	Examiner Name	
	Attorney Docket Number	CET1090.019

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

☐ That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

☐ See attached certification statement.

☐ The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☐ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/Timothy J. Ziolkowski/	Date (YYYY-MM-DD)	2015-06-12
Name/Print	Timothy J. Ziolkowski	Registration Number	38368

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

EFS Web 2.1.17

Electronic Patent Application Fee Transmittal

Application Number:	
Filing Date:	
Title of Invention:	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE
First Named Inventor/Applicant Name:	Mark J. Sarder
Filer:	Timothy J. Ziolkowski/Robyn Templin
Attorney Docket Number:	CET1090.019

Filed as Small Entity

Filing Fees for Utility under 35 USC 111(a)

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Basic Filing:				
Utility filing Fee (Electronic filing)	4011	1	70	70
Utility Search Fee	2111	1	300	300
Utility Examination Fee	2311	1	360	360
Pages:				
Claims:				
Claims in excess of 20	2202	6	40	240
Miscellaneous-Filing:				
Petition:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD($)
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
		Total in USD ($)		**970**

Electronic Acknowledgement Receipt	
EFS ID:	22617957
Application Number:	14738060
International Application Number:	
Confirmation Number:	9670
Title of Invention:	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE
First Named Inventor/Applicant Name:	Mark J. Sarder
Customer Number:	26629
Filer:	Timothy J. Ziolkowski/Robyn Templin
Filer Authorized By:	Timothy J. Ziolkowski
Attorney Docket Number:	CET1090.019
Receipt Date:	12-JUN-2015
Filing Date:	
Time Stamp:	15:03:53
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	$970
RAM confirmation Number	1521
Deposit Account	
Authorized User	
The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Application Data Sheet	App-ADS.pdf	1565471 23b835fe233595320e4a002a35008ceb2ed8e0e6	no	8
Warnings:					
Information:					
2		App-Body.pdf	132226 28cab543a489fbaeaeba1cbc4594b61147d99626	yes	26

	Multipart Description/PDF files in .zip description		
	Document Description	**Start**	**End**
	Specification	1	19
	Claims	20	25
	Abstract	26	26

Warnings:					
Information:					
3	Oath or Declaration filed	App-Dec.pdf	1265909 c028f3708d260161b95499f20cdf03143206a865	no	4
Warnings:					
Information:					
4	Drawings-only black and white line drawings	App-Drawings.pdf	721565 c1688f6d6452dbd91e547b710acc9fb08ebd49c2	no	5
Warnings:					
Information:					
5	Power of Attorney	POATransmittal.pdf	417641 5b0bc0964738bfd58604427dd494eddc6b54180c	no	1
Warnings:					
Information:					
6	Power of Attorney	GeneralPOA.pdf	295414 97387954aa8358e4735c6b113222409b5c16e56	no	1

Warnings:					
Information:					
7	Information Disclosure Statement (IDS) Form (SB08)	IDS.pdf	612308 dd5cf004515180ed090256aec04b29c88bfc3f32	no	4
Warnings:					
Information:					
8	Fee Worksheet (SB06)	fee-info.pdf	37064 ed03182852278e57cdf93544c3d66274ef4437ac	no	2
Warnings:					
Information:					
		Total Files Size (in bytes):	5047598		

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<u>New Applications Under 35 U.S.C. 111</u>
If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

<u>National Stage of an International Application under 35 U.S.C. 371</u>
If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

<u>New International Application Filed with the USPTO as a Receiving Office</u>
If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	CET1090.019
	Application Number	
Title of Invention	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE	

The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.
This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Inventor Information:

Inventor 1 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Mark	J.	Sarder	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Waukesha	State/Province	WI	Country of Residence i	US

Mailing Address of Inventor:

Address 1	W245 N5551 Corporate Circle		
Address 2			
City	Sussex	State/Province	WI
Postal Code	53089	Country i	US

Inventor 2 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Aleko	D.	Sotiriades	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

City	Cedarburg	State/Province	WI	Country of Residence i	US

Mailing Address of Inventor:

Address 1	W245 N5551 Corporate Circle		
Address 2			
City	Sussex	State/Province	WI
Postal Code	53089	Country i	US

Inventor 3 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	James	J.	Dehn	

Residence Information (Select One) ◉ US Residency ○ Non US Residency ○ Active US Military Service

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	CET1090.019
	Application Number	
Title of Invention	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE	

City	Brookfield	State/Province	WI	Country of Residence i	US

Mailing Address of Inventor:

Address 1	W245 N5551 Corporate Circle
Address 2	

City	Sussex	State/Province	WI
Postal Code	53089	Country i	US

Inventor 4 Remove

Legal Name

Prefix	Given Name	Middle Name	Family Name	Suffix
	Leigh		Jenison	

Residence Information (Select One) (•) US Residency ( ) Non US Residency ( ) Active US Military Service

City	Hartland	State/Province	WI	Country of Residence i	US

Mailing Address of Inventor:

Address 1	W245 N5551 Corporate Circle
Address 2	

City	Sussex	State/Province	WI
Postal Code	53089	Country i	US

All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the **Add** button. Add

Correspondence Information:

Enter either Customer Number or complete the Correspondence Information section below.
For further information see 37 CFR 1.33(a).

☐ **An Address is being provided for the correspondence Information of this application.**

Customer Number	26629		
Email Address		Add Email	Remove Email

Application Information:

Title of the Invention	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE		
Attorney Docket Number	CET1090.019	Small Entity Status Claimed	☒
Application Type	Nonprovisional		
Subject Matter	Utility		
Total Number of Drawing Sheets (if any)		Suggested Figure for Publication (if any)	

Filing By Reference :

EFS Web 2.2.11

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	CET1090.019
	Application Number	
Title of Invention	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE	

Only complete this section when filing an application by reference under 35 U.S.C. 111(c) and 37 CFR 1.57(a). Do not complete this section if application papers including a specification and any drawings are being filed. Any domestic benefit or foreign priority information must be provided in the appropriate section(s) below (i.e., "Domestic Benefit/National Stage Information" and "Foreign Priority Information").

For the purposes of a filing date under 37 CFR 1.53(b), the description and any drawings of the present application are replaced by this reference to the previously filed application, subject to conditions and requirements of 37 CFR 1.57(a).

Application number of the previously filed application	Filing date (YYYY-MM-DD)	Intellectual Property Authority or Country

Publication Information:

☐ Request Early Publication (Fee required at time of Request 37 CFR 1.219)

☐ **Request Not to Publish.** I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application **has not and will not** be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

Representative Information:

Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32).
Either enter Customer Number or complete the Representative Name section below. If both sections are completed the customer Number will be used for the Representative Information during processing.

Please Select One:	◉ Customer Number	○ US Patent Practitioner	○ Limited Recognition (37 CFR 11.9)
Customer Number	26629		

Domestic Benefit/National Stage Information:

This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78.
When referring to the current application, please leave the application number blank.

Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
Prior Application Status			Remove
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)

Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the **Add** button. Add

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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	CET1090.019
	Application Number	
Title of Invention	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE	

Foreign Priority Information:

This section allows for the applicant to claim priority to a foreign application. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(d). When priority is claimed to a foreign application that is eligible for retrieval under the priority document exchange program (PDX) [i]the information will be used by the Office to automatically attempt retrieval pursuant to 37 CFR 1.55(h)(1) and (2). Under the PDX program, applicant bears the ultimate responsibility for ensuring that a copy of the foreign application is received by the Office from the participating foreign intellectual property office, or a certified copy of the foreign priority application is filed, within the time period specified in 37 CFR 1.55(g)(1).

Remove

Application Number	Country [i]	Filing Date (YYYY-MM-DD)	Access Code[i] (if applicable)

Additional Foreign Priority Data may be generated within this form by selecting the **Add** button. Add

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications

☐ This application (1) claims priority to or the benefit of an application filed before March 16, 2013 and (2) also contains, or contained at any time, a claim to a claimed invention that has an effective filing date on or after March 16, 2013.
NOTE: By providing this statement under 37 CFR 1.55 or 1.78, this application, with a filing date on or after March 16, 2013, will be examined under the first inventor to file provisions of the AIA.

Authorization to Permit Access:

☒ Authorization to Permit Access to the Instant Application by the Participating Offices

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	CET1090.019
	Application Number	
Title of Invention	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE	

If checked, the undersigned hereby grants the USPTO authority to provide the European Patent Office (EPO), the Japan Patent Office (JPO), the Korean Intellectual Property Office (KIPO), the World Intellectual Property Office (WIPO), and any other intellectual property offices in which a foreign application claiming priority to the instant patent application is filed access to the instant patent application. See 37 CFR 1.14(c) and (h). This box should not be checked if the applicant does not wish the EPO, JPO, KIPO, WIPO, or other intellectual property office in which a foreign application claiming priority to the instant patent application is filed to have access to the instant patent application.

In accordance with 37 CFR 1.14(h)(3), access will be provided to a copy of the instant patent application with respect to: 1) the instant patent application-as-filed; 2) any foreign application to which the instant patent application claims priority under 35 U.S.C. 119(a)-(d) if a copy of the foreign application that satisfies the certified copy requirement of 37 CFR 1.55 has been filed in the instant patent application; and 3) any U.S. application-as-filed from which benefit is sought in the instant patent application.

In accordance with 37 CFR 1.14(c), access may be provided to information concerning the date of filing this Authorization.

Applicant Information:

Providing assignment information in this section does not substitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Applicant 1 Remove

If the applicant is the inventor (or the remaining joint inventor or inventors under 37 CFR 1.45), this section should not be completed. The information to be provided in this section is the name and address of the legal representative who is the applicant under 37 CFR 1.43; or the name and address of the assignee, person to whom the inventor is under an obligation to assign the invention, or person who otherwise shows sufficient proprietary interest in the matter who is the applicant under 37 CFR 1.46. If the applicant is an applicant under 37 CFR 1.46 (assignee, person to whom the inventor is obligated to assign, or person who otherwise shows sufficient proprietary interest) together with one or more joint inventors, then the joint inventor or inventors who are also the applicant should be identified in this section.

Clear

(•) Assignee	( ) Legal Representative under 35 U.S.C. 117	( ) Joint Inventor
( ) Person to whom the inventor is obligated to assign.	( ) Person who shows sufficient proprietary interest	

If applicant is the legal representative, indicate the authority to file the patent application, the inventor is:

Name of the Deceased or Legally Incapacitated Inventor :

If the Applicant is an Organization check here. [X]

Organization Name	Champion Engine Technology, LLC		
Mailing Address Information:			
Address 1	W245 N5551 Corporate Circle		
Address 2			
City	Sussex	**State/Province**	WI
Country [i]	US	Postal Code	53089
Phone Number		Fax Number	

PTO/AIA/14 (12-13)
Approved for use through 01/31/2014. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	CET1090.019
	Application Number	
Title of Invention	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE	

Email Address	

Additional Applicant Data may be generated within this form by selecting the Add button. Add

Assignee Information including Non-Applicant Assignee Information:

Providing assignment information in this section does not subsitute for compliance with any requirement of part 3 of Title 37 of CFR to have an assignment recorded by the Office.

Assignee 1

Complete this section if assignee information, including non-applicant assignee information, is desired to be included on the patent application publication . An assignee-applicant identified in the "Applicant Information" section will appear on the patent application publication as an applicant. For an assignee-applicant, complete this section only if identification as an assignee is also desired on the patent application publication.

Remove

If the Assignee or Non-Applicant Assignee is an Organization check here. ☐

Prefix	**Given Name**	Middle Name	**Family Name**	Suffix

Mailing Address Information For Assignee including Non-Applicant Assignee:

Address 1			
Address 2			
City		**State/Province**	
Country i		Postal Code	
Phone Number		Fax Number	
Email Address			

Additional Assignee or Non-Applicant Assignee Data may be generated within this form by selecting the Add button. Add

Signature:

Remove

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications

Signature	/Timothy J. Ziolkowski/			Date (YYYY-MM-DD)	2015-06-12
First Name	Timothy J.	Last Name	Ziolkowski	Registration Number	38368

Additional Signature may be generated within this form by selecting the Add button. Add

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U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE
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Application Data Sheet 37 CFR 1.76	Attorney Docket Number	CET1090.019
	Application Number	
Title of Invention	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE	

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE

BACKGROUND OF THE INVENTION

[0001] Embodiments of the invention relate generally to dual fuel generators, and more particularly, to an apparatus and method for delivering liquid fuel and gaseous fuel to a dual fuel generator.

[0002] Electric generators are frequently driven by internal combustion engines that use gasoline as a fuel source. Gasoline is a common fuel source for generators in a variety of applications. However, alternative fuel sources also provide a desirable fuel source. For instance, alternative fuels may provide a clean burning fuel that limits hazardous emissions. Alternative fuels may also be stored for long periods of time without degradation, whereas gasoline can degrade over a period of months leading to hard starting, rough running, and also lead to gum and varnish deposit left in the fuel system. In addition, generators that operate on alternative fuels may generate electricity when gasoline is not readily available. For instance, generators are frequently used when power outages in the utility grid result from severe weather. Unfortunately, gas stations may also be closed as a result of the power outage. Such a circumstance presents just one example where it would be advantageous to operate electrical generators on alternative fuels.

[0003] Certain generators are configured to operate as "dual fuel" generators, otherwise known as bi-fuel generators. These generators are driven by an internal combustion engine that is configured to operate on a liquid fuel for a period of operation and an alternative fuel for another period of operation. The alternative fuel source may exist in a gaseous state at normal temperature and pressure and can be any one of liquefied petroleum gas, compressed natural gas, hydrogen, or the like. Liquefied petroleum gas (LPG), often referred to as propane, exists in a gaseous state at normal temperature and pressure but can be conveniently stored under pressure in a liquid state. LPG may be a desirable fuel source for internal combustion engines because it can be stored for longer periods of time and contains fewer impurities than gasoline, resulting in smoother and cleaner operation, and often resulting in a longer lasting engine.

[0004] In order to provide the liquid and gaseous fuel to the engine, the dual fuel engine may have a first fuel line for liquid fuel and a second fuel line for gaseous fuel. A liquid fuel source and a gaseous fuel source may be coupled to the respective lines to provide fuel to the engine. However, a common problem with such configurations that couple two fuel sources to a single engine is the engine can experience overly rich air-fuel ratio when both fuels are simultaneously engaged during cross-over switching between the fuel sources. Further, such simultaneous delivery of fuel from the first fuel line and the second fuel line may make the engine hard to start or lead to unstable operating conditions.

[0005] Therefore, it would be desirable to design a dual fuel generator having a liquid fuel and gaseous fuel delivery system that overcomes the aforementioned detriments without substantially increasing the overall cost of the system.

BRIEF DESCRIPTION OF THE INVENTION

[0006] In accordance with one aspect of the invention, a mechanical fuel lockout switch for a dual fuel engine provides for the selection of a desired fuel to operate the engine. The mechanical fuel lockout switch includes a mechanical fuel valve and a fuel lockout apparatus. The mechanical fuel valve actuates between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line. The fuel lockout apparatus couples to the mechanical fuel valve ensuring individual communication of the fuel sources to the engine. The mechanical fuel lockout switch communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position.

[0007] In accordance with another aspect of the invention, a dual fuel generator and fuel delivery system includes 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 and fuel delivery system also includes a fuel regulator system located off board the dual fuel generator to control the pressure of fuel from the pressurized fuel source and deliver the fuel at a desired pressure for operation of the generator. The fuel regulator system includes 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. The fuel regulator system also includes 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. The dual fuel generator and fuel delivery system further includes a mechanical fuel valve actuateable 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.

[0008] In accordance with yet another aspect of the invention, a method of assembling a mechanical fuel lockout switch for an internal combustion engine includes providing an internal combustion engine configured to operate on a fuel from a first fuel source and a different fuel from a second fuel source. The method also includes coupling a mechanical fuel valve to the internal combustion engine actuateable between a first position and a second position to selectively control fuel flow to the internal combustion engine from the first fuel source through a first fuel line and the second fuel source through a second fuel line. The method further includes coupling a fuel lockout apparatus to the mechanical fuel valve. When the mechanical fuel valve is in the first position, the fuel lockout apparatus communicates the first fuel source to the internal combustion engine and prevents the second fuel source from coupling to the internal combustion engine, and actuation of the mechanical fuel valve to the second position causes the fuel lockout apparatus to permit the second fuel source to couple to the internal combustion engine, and interrupts the first fuel source communication with the internal combustion engine.

[0009] Various other features and advantages will be made apparent from the following detailed description and the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The drawings illustrate preferred embodiments presently contemplated for carrying out the invention.

[0011] In the drawings:

[0012] FIG. 1 is a perspective view of a dual fuel generator coupled to a fuel delivery system, according to an embodiment of the invention.

[0013] FIG. 2 is a detail view of a portion of the generator of FIG. 1 about a mechanical fuel lockout switch with the switch in a first position, according to an embodiment of the invention.

[0014] FIG. 3 is a detail view similar to FIG. 2 and showing the mechanical fuel lockout switch in a second position, with an LPG supply line connected thereto, according to an embodiment of the invention.

[0015] FIG. 4A is a schematic diagram of a fuel system for the dual fuel generator of FIG. 1 showing a liquid fuel source in communication with a carburetor of the generator consistent with the first position of the switch as shown in FIG. 2, according to an embodiment of the invention.

[0016] FIG. 4B is a schematic diagram of the fuel system of FIG. 4A showing a gaseous fuel source in communication with a carburetor of the generator of FIG. 1 consistent with the second position of the switch as shown in FIG. 3, according to an embodiment of the invention.

[0017] FIG. 5 is a perspective view of a fuel delivery system for the dual fuel generator of FIG. 1, according to an embodiment of the invention.

[0018] FIG. 6 is a side view of a fuel delivery system for the dual fuel generator of FIG. 1, according to an embodiment of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0019] The operating environment of the invention is described with respect to a dual fuel generator. However, it will be appreciated by those skilled in the art that the invention is equally applicable for use with any dual fuel internal combustion engine. Moreover, the invention will be described with respect to a dual fuel generator configured to operate on a liquid fuel and a gaseous fuel. However, one skilled in the art will further appreciate that the invention is equally applicable for use with other fuel combinations for dual fuel generators and internal combustion engines.

[0020] Referring to FIG. 1, a dual fuel generator 20 is coupled to a fuel delivery system 22, in accordance with an embodiment of the invention. Dual fuel generator 20 includes an internal combustion engine (not shown) within housing 21 at one end 24, operatively connected to an alternator also enclosed in housing 21 at another end 26, by conventional means. Dual fuel generator 20 is configured to operate on different fuels via either a first fuel source 28 or a second fuel source 30. In an exemplary embodiment of the invention, first fuel source 28 is a liquid fuel and second fuel source 30 is a gaseous fuel. The liquid fuel may be gasoline and the gaseous fuel may be liquid petroleum gas (LPG). Each can selectively operate the generator as desired and controlled by an operator. For instance, generator 20 may operate on gasoline for a first period of operation and then switch to LPG for a second period of operation. However, it is contemplated that dual fuel generator 20 is configured to operate on fuels other than gasoline and LPG (e.g., natural gas, biodiesel, etc.), and thus the scope of the invention is not meant to be limited strictly to a dual fuel arrangement where first fuel source 28 provides gasoline and second fuel source 30 provides LPG.

[0021] In one embodiment of the invention, dual fuel generator 20 includes a gasoline tank 32 or, generally, a liquid fuel tank, located inside cover 21 onboard generator 20 to provide gasoline to the engine as first fuel source 28. Gasoline tank 32 connects to a first fuel line to provide gasoline to the carburetor to run the engine, as will later be described with reference to FIG. 4A and 4B. Generator 20 is also coupled to a pressurized fuel container 34, or a pressurized fuel source, located off board

generator 20 to provide LPG to the engine as second fuel source 30. Pressurized fuel container 34 is coupled to generator 20 with an LPG supply hose 36. LPG supply hose 36 is coupled to a second fuel line within generator 20 to provide LPG to the carburetor to run the engine. Dual fuel generator 20 includes a mechanical fuel lockout switch 38 for selecting a desired fuel to be provided to the engine. The mechanical fuel lockout switch 38 is actuated to select first fuel source 28 when in a first position, as shown in FIG. 2, and alternately to select second fuel source 30 when in a second position, as shown in FIG. 3.

[0022] Referring back to FIG. 1, in an exemplary embodiment, fuel 30 from pressurized fuel container 34 is regulated using a fuel regulator system 39 for delivery to the engine. Fuel regulator system 39 includes one or more pressure regulators that reduce and control the pressure of the fuel from pressurized fuel container 34 and delivers fuel at a desired pressure for operation of the engine. Fuel regulator system 39 has an inlet 41 operatively coupled to a service valve 40 of pressurized fuel container 34 and an outlet 43 coupled to LPG supply hose 36. Fuel regulator system 39 includes a primary pressure regulator 42 coupled to pressurized fuel container 34 and a secondary pressure regulator 44. Primary pressure regulator 42 protects downstream components from high pressure of pressurized fuel container 34. Primary pressure regulator 42 receives LPG through service valve 40 of pressurized fuel container 34 and reduces the pressure of the LPG to a first stage. In one embodiment of the invention, the first stage may be delivered directly to generator 20 at a pressure required for operation of the engine.

[0023] In an exemplary embodiment of the invention, fuel regulator system 39 includes secondary pressure regulator 44 coupled to the outlet of primary pressure regulator 42 in order to use standard "off-the-shelf" components. Typically, the primary pressure regulator is mounted on the LPG tank, while the secondary pressure regulator is mounted on the component using the fuel, such as an engine or grill. Here, since generator 20 can be used as a gasoline only generator, secondary pressure regulator 44 is mounted off-board the generator to reduce size and cost of the generator. Secondary pressure regulator 44 receives LPG from primary pressure regulator 42 and further

reduces the pressure of LPG to a second stage to be delivered to generator 20. In a system with two regulators, primary pressure regulator 42 regulates fuel received from pressurized fuel container 34 and reduces the pressure of the fuel to a level required for operation of secondary pressure regulator 44. Secondary pressure regulator 44 regulates fuel received from primary pressure regulator 42 and further reduces the pressure of the fuel to a level required for operation of generator 20. In addition, primary pressure regulator 42 may compensate for varying tank pressure as fuel is depleted while secondary pressure regulator 44 may compensate for varying demand from generator 20.

[0024] In accordance with an exemplary embodiment of the invention, fuel regulator system 39 includes both the primary and secondary regulators, or a custom single regulator, but in any case is located remotely, or off-board, from dual fuel generator 20. Fuel regulator system 39 may be directly mounted to pressurized fuel container 34 using a regulator mounting bracket 46. Regulator mounting bracket 46 has mounting locations for primary pressure regulator 42 and secondary pressure regulator 44. Regulator mounting bracket 46 also has a securing mechanism 48 to secure regulator mounting bracket 46 to pressurized fuel container 34.

[0025] In another embodiment of the invention, primary pressure regulator 42 is mounted on regulator mounting bracket 46 while secondary pressure regulator 44 could be mounted on or near generator 20. In yet another embodiment of the invention, a dual stage regulator may regulate the fuel received from pressurized fuel container 34 and deliver fuel at a pressure required for operation of generator 20. Such a dual stage regulator may regulate the fuel to the second stage within a single structure. The dual stage regulator may be mounted directly on fuel container 34.

[0026] Referring to FIG. 2, a detail view of a portion of generator 20 of FIG. 1 depicts mechanical fuel lockout switch 38 in a first position 38(a), in accordance with an embodiment of the invention. In this position, mechanical fuel lockout switch 38 provides gasoline flow from gasoline tank 32 to the engine while preventing connection of an LPG supply line to fuel inlet 59 of the second fuel line, as will later be discussed

in detail with reference to FIGS. 4A and 4B. Still referring to FIG. 2, mechanical fuel lockout switch 38 provides a combination liquid fuel shutoff valve and a gaseous fuel supply lockout that prevents simultaneous delivery of fuel to the engine from gasoline tank 32 and pressurized fuel container 34, FIG. 1. As such, mechanical fuel lockout switch 38 provides a fuel selector to ensure only the selected fuel is provided to dual fuel generator 20.

[0027] Mechanical fuel lockout switch 38, FIG. 2, includes mechanical fuel valve 54 actuateable between first position 38(a) as shown in FIG. 2 and second position 38(b) as shown in FIG. 3 to selectively control fuel flow to the dual fuel engine from first fuel source 28 through a first fuel line and second fuel source 30 through a second fuel line 36. Mechanical fuel lockout switch 38 may also include fuel lockout apparatus 58 coupled to mechanical fuel valve 54 to communicate fuel sources individually to generator 20. In one embodiment of the invention, fuel lockout apparatus 58 communicates first fuel source 28 to the engine by actuating mechanical fuel valve 54 to first position 38(a) to open the first fuel line as shown in FIG. 2, and communicates second fuel source 30 to the engine by actuating mechanical fuel valve 54 to second position 38(b) to open communication of the second fuel source 30 to the engine as shown in FIG. 3. Referring back to FIG. 2, when mechanical fuel valve 54 is in first position 38(a), fuel lockout apparatus 58 communicates first fuel source 28 to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine.

[0028] In an exemplary embodiment of the invention, mechanical fuel valve 54 controls the flow of LPG to the engine by actuating fuel lockout apparatus 58 to block or unblock fuel inlet 59 for the second fuel source. Mechanical fuel valve 54 is coupled to the first fuel line, as shown in FIGS. 4A and 4B, and therefore can control the flow of gasoline to the engine by opening and closing the first fuel line. When the mechanical fuel valve 54, FIG. 2, is in the first position 38(a), gasoline flows from the gasoline tank to the engine and the fuel lockout apparatus 58 blocks the fuel inlet 59. Accordingly, fuel lockout apparatus 58 prevents LPG flow to generator 20 when the mechanical fuel valve 54 is in first position 38(a) wherein the engine is operated on gasoline.

[0029] Mechanical fuel valve 54 includes a fuel valve handle 56 to control the opening and closing of the valve. Fuel valve handle 56 is movable between first position 38(a) as shown in FIG. 2 and second position 38(b) as shown in FIG. 3. Mechanical fuel valve 54 opens the first fuel line (to enable liquid fuel flow to the engine) when fuel valve handle 56 is in the first position, and mechanical fuel valve 54 closes the first fuel line (to prevent liquid fuel flow to the engine) when fuel valve handle 56 is in the second position. Thus, when fuel valve handle 56 is in first position 38(a) as shown in FIG. 2, mechanical fuel valve 54 opens the first fuel line and allows gasoline from gasoline tank 32 to flow to the engine.

[0030] Fuel valve handle 56 is coupled to fuel lockout apparatus 58. Fuel valve handle 56 actuates with fuel lockout apparatus 58 to prevent LPG flow to generator 20 when gasoline flow to the generator is enabled. Fuel lockout apparatus 58 is controlled by fuel valve handle 56 so that moving fuel valve handle 56 to the first position causes fuel lockout apparatus 58 to block fuel inlet 59 for LPG, and moving fuel valve handle 56 to the second position causes fuel lockout apparatus 58 to unblock fuel inlet 59 for LPG.

[0031] In an exemplary embodiment of the invention, fuel valve handle 56 rotates between the first position and the second position and fuel lockout apparatus 58 is rigidly coupled to the rotating handle. Fuel lockout apparatus 58 may include a fuel inlet cover 61, which may be a flange, coupled to fuel valve handle 56 so that fuel inlet cover 61 rotates with the handle. Fuel inlet cover 61 extends radially outward from fuel valve handle 56 and sweeps over fuel inlet 59 for LPG as fuel valve handle 56 rotates. That is, fuel inlet cover 61 rotates transversely across fuel inlet 59 and blocks access thereto. Accordingly, fuel inlet cover 61 prevents LPG flow to generator 20 when fuel valve handle 56 is in first position 38(a) to allow gasoline to run the engine.

[0032] Referring to FIG. 3, a detail view of a portion of generator 20 of FIG. 1 depicts mechanical fuel lockout switch 38 in a second position 38(b), in accordance with an embodiment of the invention. In this position, the mechanical fuel lockout switch 38 provides a disconnect to stop gasoline flow from gasoline tank 32 to the

engine while allowing connection of LPG supply hose 36 to fuel inlet 59 of the second fuel line. FIG. 3 further shows LPG supply hose 36 coupling second fuel source 30 to generator 20 to deliver LPG to run the generator.

[0033] Mechanical fuel lockout switch 38 includes mechanical fuel valve 54 coupled to fuel lockout apparatus 58 to prevent gasoline flow to generator 20 when LPG from the LPG service hose 36 is supplied to the engine. In one embodiment of the invention, actuation of mechanical fuel valve 54 to second position 38(b) causes fuel lockout apparatus 58 to allow communication of second fuel source 30 to the dual fuel engine, and interrupts the first fuel source 28 communication with the dual fuel engine. The position of fuel lockout apparatus 58 prevents the fuel valve handle 56 from moving to first position 38(a) (FIG. 2) while LPG supply hose 36 is connected to generator 20.

[0034] A quick-disconnect hose coupling 50, also referred to as a quick-connect hose coupling, connects LPG supply hose 36 to generator 20 so that LPG supply hose 36 may be quickly attached and detached from generator 20. Hose coupling 50 has a first end 50a mounted on the external surface of generator 20 and coupled to supply the second fuel to the engine. Hose coupling 50 has a second end 50b coupled to the outlet of LPG supply hose 36. Hose coupling 50 has a valve that opens when the couplings are engaged and closes when the couplings are disengaged. As such, quick-disconnect hose coupling 50 automatically opens when connected to enable fuel flow from LPG supply hose 36 to the engine. Hose coupling 50 automatically disconnects fluid communication when disconnected. Accordingly, when the supply hose is detached from generator 20, the coupling 50 is automaticlaly closed so that fuel does not escape and unwanted air does not enter the fuel system.

[0035] In one embodiment, fuel inlet cover 61 is coupled to fuel valve handle 56 so that it is spaced apart from the surface of generator 20 to provide clearance for first end 50a of the quick-disconnect hose coupling 50 that protrudes from the surface of generator 20. As shown in FIG. 2, fuel inlet cover 61 blocks off first end 50a of the quick-disconnect hose coupling when fuel valve handle 56 is rotated to first position 38(a) to enable gasoline flow so that fuel inlet cover 61 prevents connection of LPG

supply hose 36 (FIG. 3) to generator 20. As shown in FIG. 3, fuel inlet cover 61 uncovers first end 50a of the quick-disconnect hose coupling 50 when fuel valve handle 56 is rotated to second position 38(b) to disable gasoline flow so that fuel inlet cover 61 permits connection of LPG supply hose 36 to generator 20.

[0036] To operate generator 20 on LPG, fuel valve handle 56 is turned to second position 38(b) to disable the flow of gasoline to the engine and to expose first end 50a of hose coupling 50 on generator 20. LPG supply hose 36 is then connected to generator 20 via hose coupling 50 to enable the flow of LPG to the engine. To operate generator 20 on gasoline, LPG supply hose 36 is disconnected from generator 20 via hose coupling 50 to disable the flow of LPG to the engine and to unblock fuel valve handle 56 from rotating to the first position. As shown in FIG. 2, fuel valve handle 56 is then turned to first position 38(a) to enable the flow of gasoline to generator 20.

[0037] Referring to FIG. 4A, a schematic diagram of a fuel system for a dual fuel engine shows mechanical fuel lockout switch 38 in first position 38(a) to provide communication between the first fuel source 28 and dual fuel carburetor 62, according to an embodiment of the invention. Mechanical fuel lockout switch 38 prevents communication between second fuel source 30 and dual fuel carburetor 62 when the switch is in first position 38(a). In one embodiment of the invention, first fuel source 28 includes a gasoline tank 32 to provide gasoline to carburetor 62 through a first fuel line 66, and second fuel source 30 includes a propane or LPG tank 68 to provide propane or LPG to carburetor 62 through a second fuel line 70. Accordingly, first fuel line 66 may be a liquid fuel line and second fuel line 70 may be a gaseous fuel line.

[0038] Mechanical fuel lockout switch 38 includes a mechanical fuel valve 54 actuateable between first position 38(a) as shown in FIG. 4A and second position 38(b) as shown in FIG. 4B to selectively control fuel flow to the dual fuel engine from first fuel source 28 through first fuel line 66 and second fuel source 30 through second fuel line 70. Referring back to FIG. 4A, mechanical fuel valve 54 selectively controls fuel flow through first fuel line 66 by opening the line when the mechanical fuel lockout switch 38 actuates to first position 38(a). Mechanical fuel valve 54 may be coupled to

fuel lockout apparatus 58 that actuates with mechanical fuel valve 54 to block and unblock fuel inlet 59 of second fuel line 70. First end 50a of the quick-disconnect hose coupling is located at fuel inlet 59 and a mating end 50b of the quick-disconnect hose coupling is coupled to the propane or LPG tank 68. Actuation of mechanical fuel valve 54 to first position 38(a) causes fuel lockout apparatus 58 to block fuel inlet 59 to prevent coupling the first end 50a and second end 50b of the quick-disconnect hose coupling together, and actuation of mechanical fuel valve 54 to another position causes fuel lockout apparatus 58 to unblock fuel inlet 59 to permit attaching first end 50a and second end 50b together.

[0039] In one embodiment of the invention, a fuel cut solenoid 63 couples to carburetor 62 to regulate liquid fuel flow into a main nozzle within the carburetor. Fuel cut solenoid 63 is advantageous to control liquid fuel flow downstream of a float bowl in the carburetor and can stop fuel flow to the engine immediately after ignition shutdown. As such, fuel cut solenoid 63 prevents the engine from drawing in fuel from the float bowl while the engine shuts off. Fuel cut solenoid 63 also traps fuel in the float bowl to eliminate delay in filling the bowl when starting the engine on liquid fuel, and prevents liquid fuel flow from the float bowl to the engine when starting on gaseous fuel.

[0040] Fuel cut solenoid 63 may regulate fuel flow through multiple fuel lines in carburetor 62 that provide fuel from the float bowl to the engine. For instance, carburetor 62 may have a main fuel line and an idle fuel line that receive fuel from the float bowl. Fuel cut solenoid 63 may control fuel flow through all of the fuel lines that receive fuel from the float bowl or may regulate only some of the fuel lines. As such, fuel cut solenoid 63 may block fuel flow through the main fuel line while small amounts of fuel can flow through the idle fuel line.

[0041] Fuel cut solenoid 63 preferably operates as a normally closed valve that opens when powered by a 12 volt battery 65, although fuel cut solenoid 63 may also be operated as a normally open valve. The normally closed valve is opened for gasoline mode to allow gasoline flow to the engine and closed for LPG mode to prevent gasoline

flow to the engine. Fuel cut solenoid 63 is operated by an electrical switch 67 which may be mechanically actuated and controlled by mechanical fuel lockout switch 38. As such, actuation of mechanical fuel lockout switch 38 to first position 38(a) closes electrical switch 67 to power and open fuel cut solenoid 63 as represented in FIG. 4A, and actuation of mechanical fuel lockout switch 38 to second position 38(b) opens electrical switch 67 to interrupt power and close fuel cut solenoid 63 as represented in FIG. 4B.

[0042] Referring to FIG. 4B, a schematic diagram of a fuel system for a dual fuel engine shows mechanical fuel lockout switch 38 in second position 38(b) to provide communication between second fuel source 30 and dual fuel carburetor 62, according to an embodiment of the invention. Mechanical fuel lockout switch 38 prevents communication between first fuel source 28 and dual fuel carburetor 62 when the switch is in second position 38(b). The dual fuel engine has a first fuel line 66 to provide fuel from first fuel source 28 to carburetor 62 and a second fuel line 70 to provide fuel from second fuel source 30 to carburetor 62.

[0043] Mechanical fuel lockout switch 38 includes mechanical fuel valve 54 that selectively controls fuel flow through first fuel line 66 by closing the line when mechanical fuel lockout switch 38 actuates to second position 38(b). Mechanical fuel lockout switch 38 may also include a mechanical lockout apparatus 58 to block and unblock fuel inlet 59 of the second fuel line 70. Fuel inlet 59 may include first end 50a of the quick-connect hose coupling mounted on the generator and coupled to second fuel line 70. Second end 50b of the quick-connect hose coupling is coupled to the outlet of second fuel source 30, and the first end 50a mates with second end 50b to quickly attach propane or LPG tank 68 to second fuel line 70. Fuel lockout apparatus 58 may also hold mechanical fuel lockout switch 38 in second position 38(b) when the propane or LPG tank 68 is coupled to the engine via the ends 50a, 50b of the quick-connect hose coupling.

[0044] Fuel cut solenoid 63 couples to carburetor 62 to regulate liquid fuel flow through the carburetor as described with respect to FIG. 4A. FIG. 4B shows electrical

switch 67 opened to interrupt power and close fuel cut solenoid 63 for LPG mode when mechanical fuel lockout switch 38 is in second position 38(b).

[0045] FIG. 4A and 4B depict an embodiment where mechanical fuel valve 54 operates along first fuel line 66 to provide a flow path for first fuel source 28 to carburetor 62 when the valve is in first position 38(a). That is, mechanical fuel valve 54 may control a single fuel line that runs through the valve while operating fuel lockout apparatus 58 to control fuel flow through second fuel line 70. Embodiments of the invention also contemplate mechanical fuel valve 54 configured to operate along second fuel line 70 to provide a flow path for second fuel source 30 to carburetor 62 when the valve is in second position 38(b). Mechanical fuel valve 54 may be configured to control multiple fuel lines that run through the valve according to embodiments of the invention.

[0046] Referring now to FIG. 5, a perspective view of fuel delivery system 22 for dual fuel generator 20 of FIG. 1 is shown, in accordance with an embodiment of the invention. Fuel delivery system 22 includes a mounting arrangement for fuel regulator system 39. The mounting arrangement includes regulator mounting bracket 46 for mounting fuel regulator system 39. Regulator mounting bracket 46 extends around the outer periphery of collar 136 on pressurized fuel container 34. Regulator mounting bracket 46 has securing mechanism 48 to secure to collar 136. In one embodiment, securing mechanism 48 is a rigid component that extends inward from regulator mounting bracket 46 with a slot for receiving collar 136 to hold regulator mounting bracket 46 to collar 136.

[0047] Regulator mounting bracket 46 provides mounting locations for pressure regulators. In one embodiment, regulator mounting bracket 46 is made of sheet metal bent in two locations to provide a central panel 138, a first outer panel 140, and a second outer panel 142 for mounting the regulators. The panels may be angled from each other such that regulator mounting bracket 46 fits around collar 136. Primary pressure regulator 42 mounts on first outer panel 140 and secondary pressure regulator 44 mounts on second outer panel 142. The panels are sized according to their respective

regulators. Accordingly, second outer panel 142 is larger than first outer panel 140 if secondary pressure regulator 44 is larger than primary pressure regulator 42. Panels 140, 142 have fasteners or openings to receive fasteners to couple respective regulators 42, 44 to the panels. Regulator mounting bracket 46 rests on top of pressurized fuel container 34 and engages the periphery of collar 136 to support fuel regulator system 39 on the container.

[0048] In one embodiment of the invention, primary pressure regulator 42 couples to two ninety degree elbows 144, 145 to reach around collar 136 in order to couple to service valve 40. The two elbows 144, 145 are joined by a hose or pipe 146 that leads from elbow 144 at service valve 40 to elbow 145 at the outer periphery of collar 136. The outlet of primary pressure regulator 42 couples to a hose 148 that extends to another ninety degree elbow 150 coupled to the inlet of secondary pressure regulator 44. Secondary pressure regulator 44 couples to LPG supply hose 36. Pressurized fuel container 34 may be strapped to a dolly 152.

[0049] Referring now to FIG. 6, a side view of another fuel delivery system 22 for dual fuel generator 20 of FIG. 1 is shown, in accordance with an embodiment of the invention. Fuel delivery system 22 includes a mounting arrangement for fuel regulator system 39. The mounting arrangement includes a regulator mounting structure 154 for mounting fuel regulator system 39 to pressurized fuel container 34. Regulator mounting structure 154 includes a cylinder 156 that surrounds the circumference of pressurized fuel container 34 to secure regulator mounting structure 154 radially along the circumference of pressurized fuel container 34. Cylinder 156 couples to a dome 158 to support cylinder 156 relative to the top of pressurized fuel container 34. Dome 158 has a central opening 160 through which collar 136 of pressurized fuel container 34 extends. Collar 136 of pressurized fuel container 34 extends through dome 158 so that service valve 40 is easily accessible from above regulator mounting structure 154 and so that dome 158 sits on pressurized fuel container 34 around collar 136.

[0050] Regulator mounting structure 154 supports pressure regulators around the outer circumference of cylinder 156. In some embodiments of the invention, a dual

stage pressure regulator 162 functions as both a primary pressure regulator and a secondary pressure regulator in a single integral component, and dual stage pressure regulator 162 may be mounted on regulator mounting structure 154. In other embodiments in of the invention, primary pressure regulator 42 (FIG. 5) is mounted to service valve 40 while secondary pressure regulator 44 (FIG. 5) is mounted on regulator mounting structure 154. Alternatively, both primary pressure regulator 42 (FIG. 5) and secondary pressure regulator 44 (FIG. 5) may be mounted on regulator mounting structure 154.

[0051] Fuel regulator system 39 may be coupled to service valve 40 by a flexible connector called a pigtail 164. Pigtail 164 absorbs shock in the system from pressure surges and from movement of downstream components. Pigtail 164 can be looped to conserve space and therefore pressurized fuel container 34 is referred to as an LPG pig. Accordingly, regulator mounting structure 154 is referred to as a pig hat because it fits on the LPG pig. Pressurized fuel container 34 may be secured to a platform or mobile cart 64 for stability or transportation. In another embodiment, a regulator mounting device, including regulator mounting structure 154 or regulator mounting bracket 46 (FIG. 5), is secured directly to a platform or a mobile cart.

[0052] Beneficially, embodiments of the invention provide for a mechanical fuel lockout switch to ensure that two fuels are not simultaneously delivered to a dual fuel internal combustion engine. Embodiments of the invention also provide for a dual fuel generator with a remotely mounted gaseous fuel regulator system.

[0053] Therefore, according to one embodiment of the invention, a mechanical fuel lockout switch for a dual fuel engine includes a mechanical fuel valve actuateable between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line. The mechanical fuel lockout switch also includes a fuel lockout apparatus coupled to the mechanical fuel valve. The mechanical fuel lockout switch communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the

mechanical fuel valve is in the first position, and communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position.

[0054] According to another embodiment of the invention, a dual fuel generator and fuel delivery system includes 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 and fuel delivery system also includes a fuel regulator system located off board the dual fuel generator. The fuel regulator system includes 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. The fuel regulator system also includes 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. The dual fuel generator and fuel delivery system further includes a mechanical fuel valve actuateable 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.

[0055] According to yet another embodiment of the invention, a method of assembling a mechanical fuel lockout switch for an internal combustion engine includes providing an internal combustion engine configured to operate on a fuel from a first fuel source and a different fuel from a second fuel source. The method also includes coupling a mechanical fuel valve to the internal combustion engine actuateable between a first position and a second position to selectively control fuel flow to the internal combustion engine from the first fuel source through a first fuel line and the second fuel source through a second fuel line. The method further includes coupling a fuel lockout apparatus to the mechanical fuel valve. When the mechanical fuel valve is in the first position, the fuel lockout apparatus communicates the first fuel source to the internal combustion engine and prevents the second fuel source from coupling to the internal combustion engine, and actuation of the mechanical fuel valve to the second position

causes the fuel lockout apparatus to permit the second fuel source to couple to the internal combustion engine, and interrupts the first fuel source communication with the internal combustion engine.

[0056] This written description uses examples to disclose the invention, including the best mode, and also to enable any person skilled in the art to practice the invention, including making and using any devices or systems and performing any incorporated methods. The patentable scope of the invention is defined by the claims, and may include other examples that occur to those skilled in the art. Such other examples are intended to be within the scope of the claims if they have structural elements that do not differ from the literal language of the claims, or if they include equivalent structural elements with insubstantial differences from the literal languages of the claims.

CLAIMS

What is claimed is:

1. A mechanical fuel lockout switch for a dual fuel engine comprising:

a mechanical fuel valve actuateable between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line; and

a fuel lockout apparatus coupled to the mechanical fuel valve;

wherein the mechanical fuel lockout switch:

communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and

communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position.

2. The mechanical fuel lockout switch for a dual fuel engine of claim 1, wherein the fuel lockout apparatus prevents actuation of the mechanical fuel valve to the first position when the second fuel source communicates with the dual fuel engine.

3. The mechanical fuel lockout switch for a dual fuel engine of claim 1, wherein the fuel lockout apparatus is configured to:

prevent the second fuel source from coupling to the second fuel line while the mechanical fuel valve is in the first position; and

permit the second fuel source to couple to the second fuel line while the mechanical fuel valve is in the second position.

4. The mechanical fuel lockout switch for a dual fuel engine of claim 3, wherein the fuel lockout apparatus comprises a flange rigidly coupled to the mechanical fuel valve that covers an inlet of the second fuel line while the mechanical fuel valve is

in the first position and uncovers the inlet of the second fuel line while the mechanical fuel valve is in the second position.

5. The mechanical fuel lockout switch for a dual fuel engine of claim 4, wherein the mechanical fuel valve rotates between the first position and the second position and the flange rotates transversely across the inlet of the second fuel line.

6. The mechanical fuel lockout switch for a dual fuel engine of claim 4, further comprising;

a first end of a quick-disconnect hose coupling attached to the inlet of the second fuel line; and

a second end of the quick-disconnect hose coupling attached to the second fuel source to mate with the first end of the quick-disconnect hose coupling to couple the second fuel source to the second fuel line.

7. The mechanical fuel lockout switch for a dual fuel engine of claim 1, wherein the mechanical fuel valve and the fuel lockout apparatus operate together to ensure that fuel from the first fuel source and fuel from the second fuel source are not simultaneously delivered to the dual fuel engine.

8. The mechanical fuel lockout switch for a dual fuel engine of claim 7, wherein the first fuel source provides liquid fuel from a liquid fuel tank to the dual fuel engine and the second fuel source provides gaseous fuel from a pressurized fuel container to the dual fuel engine.

9. A dual fuel generator and fuel delivery system comprising:

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;

a fuel regulator system located off board the dual fuel generator, the fuel regulator system comprising:

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

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

a mechanical fuel valve actuateable 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.

10. The dual fuel generator and fuel delivery system of claim 9 further comprising a fuel lockout apparatus coupled to the mechanical fuel valve; and

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.

11. The dual fuel generator and fuel delivery system of claim 9, wherein mechanical fuel valve opens and closes the liquid fuel line to selectively control fuel flow from the liquid fuel source to the dual fuel generator; and further comprises:

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.

12. The dual fuel generator and fuel delivery system of claim 11, 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.

13. The dual fuel generator and fuel delivery system of claim 11, 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 mechanical fuel lockout switch the inlet of the gaseous fuel line when the mechanical fuel valve closes the liquid fuel line.

14. The dual fuel generator and fuel delivery system of claim 9, 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.

15. The dual fuel generator and fuel delivery system of claim 9, further comprising a regulator mounting device secured to the pressurized fuel source with at least the secondary pressure regulator mounted on the regulator mounting device.

16. The dual fuel generator and fuel delivery system of claim 15, wherein the primary pressure regulator is mounted on the regulator mounting device.

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 secures 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 9, wherein the primary and secondary pressure regulators are integral components of a dual stage pressure regulator.

19. A method of assembling a mechanical fuel lockout switch for an internal combustion engine comprising:

providing an internal combustion engine configured to operate on a fuel from a first fuel source and a different fuel from a second fuel source;

coupling a mechanical fuel valve to the internal combustion engine actuateable between a first position and a second position to selectively control fuel flow to the internal combustion engine from the first fuel source through a first fuel line and the second fuel source through a second fuel line; and

coupling a fuel lockout apparatus to the mechanical fuel valve;

wherein when the mechanical fuel valve is in the first position, the fuel lockout apparatus communicates the first fuel source to the internal combustion engine and prevents the second fuel source from coupling to the internal combustion engine, and actuation of the mechanical fuel valve to the second position causes the fuel lockout apparatus to permit the second fuel source to couple to the internal combustion engine, and interrupts the first fuel source communication with the internal combustion engine.

20. The method of claim 19, wherein the fuel lockout apparatus prevents actuation of the mechanical fuel valve to the first position when the second fuel source is coupled to the internal combustion engine.

21. The method of claim 20, wherein the fuel lockout apparatus is further configured to:

prevent coupling of the second fuel source to the second fuel line while the mechanical fuel valve is in the first position; and

permit coupling of the second fuel source to the second fuel line while the mechanical fuel valve is in the second position.

22. The method of claim 19, wherein the fuel lockout apparatus comprises a fuel inlet cover configured to actuate in unison with the mechanical fuel valve to cover a fuel inlet on the internal combustion engine for the second fuel source when the mechanical fuel valve is in the first position and uncover the fuel inlet when the mechanical fuel valve is in the second position.

23. The method of claim 19, further comprising coupling a fuel regulator system to the second fuel source to reduce fuel pressure therefrom and deliver fuel to the second fuel line at a pressure required for operation of the internal combustion engine.

24. The method of claim 23, further comprising mounting the fuel regulator system to the second fuel source located off-board the internal combustion engine.

25. The method of claim 23, further comprising:

coupling one end of a quick-disconnect hose coupling to an inlet on the internal combustion engine for the second fuel source; and

coupling a mating end of the quick-disconnect hose coupling to an outlet of the fuel regulator system.

26. The method of claim 19, further comprising providing gasoline in a liquid fuel tank as the first fuel source and LPG in a pressurized fuel container as the second fuel source.

ABSTRACT

A mechanical fuel lockout switch for a dual fuel engine includes a mechanical fuel valve actuateable between a first position and a second position to selectively control fuel flow to the dual fuel engine from a first fuel source through a first fuel line and a second fuel source through a second fuel line. The mechanical fuel lockout switch also includes a fuel lockout apparatus coupled to the mechanical fuel valve. The mechanical fuel lockout switch communicates the first fuel source to the dual fuel engine and prevents communication between the second fuel source and the dual fuel engine when the mechanical fuel valve is in the first position, and communicates the second fuel source to the dual fuel engine and interrupts the first fuel source communication with the dual fuel engine when in the second position.

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE

As the below named inventor, I hereby declare that:

This declaration is directed to:

☑ The attached application, or

☐ United States application or PCT international application number _____

filed on _____

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

WARNING:

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LEGAL NAME OF INVENTOR

Inventor: Mark J. Sarder Date (Optional): _____

Signature: Mark J. Sarder

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional PTO/AIA/01 form for each additional inventor.

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

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LEGAL NAME OF INVENTOR

Inventor: Aleko D. Sotiriades Date (Optional): _____

Signature: Aleko D. Sotiriades

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional PTO/AIA/01 form for each additional inventor.

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

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LEGAL NAME OF INVENTOR

Inventor: James J. Dehn Date (Optional): 6/12/2015

Signature: James J Dehn

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional PTO/AIA/01 form for each additional inventor.

DECLARATION (37 CFR 1.63) FOR UTILITY OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 CFR 1.76)

Title of Invention	DUAL FUEL LOCKOUT SWITCH FOR GENERATOR ENGINE

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☑ The attached application, or

☐ United States application or PCT international application number _____

filed on _____

The above-identified application was made or authorized to be made by me.

I believe that I am the original inventor or an original joint inventor of a claimed invention in the application.

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LEGAL NAME OF INVENTOR

Inventor: Leigh Jenison Date (Optional): 6.12.2015

Signature: Leigh Jenison

Note: An application data sheet (PTO/SB/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional PTO/AIA/01 form for each additional inventor.

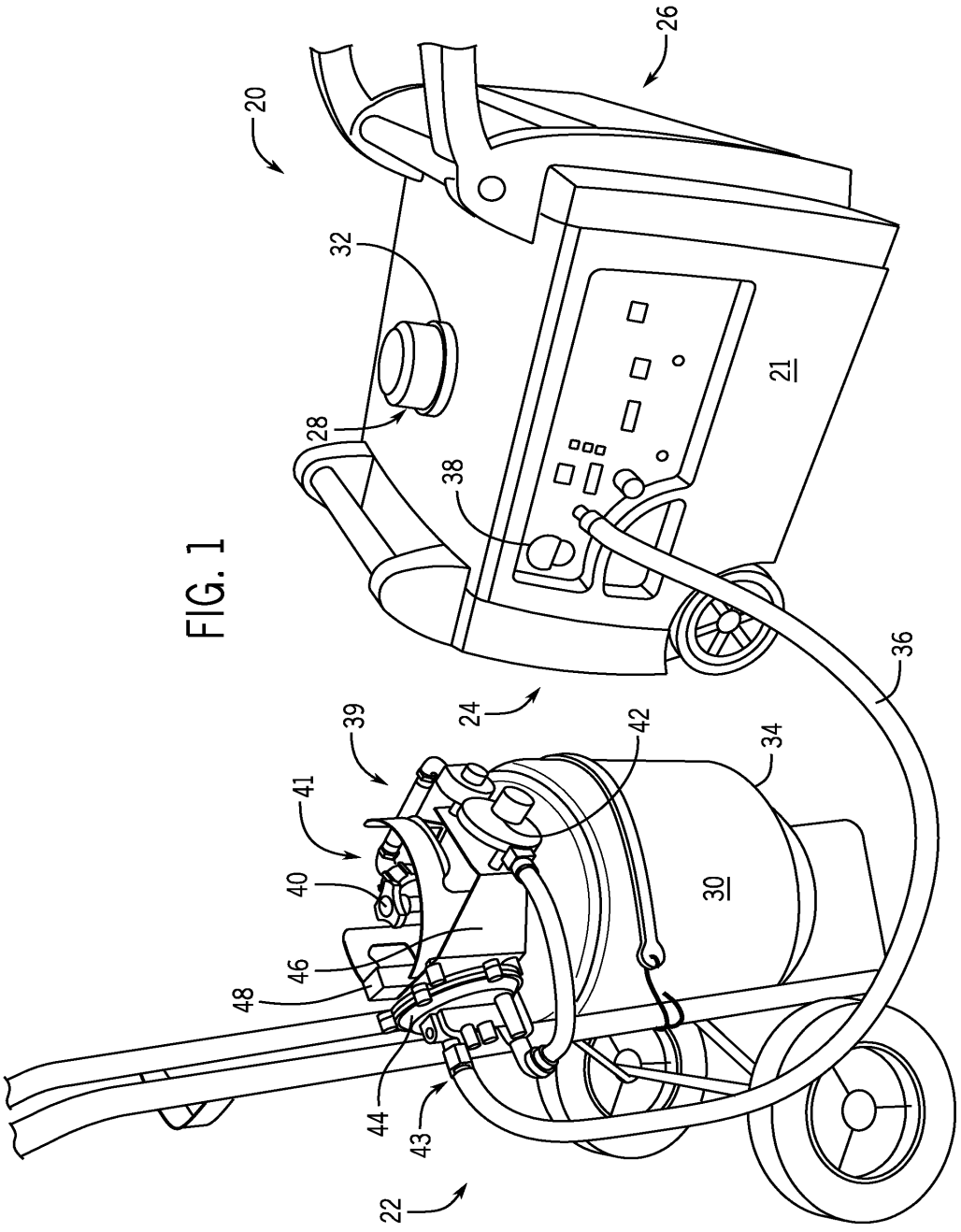


FIG. 1

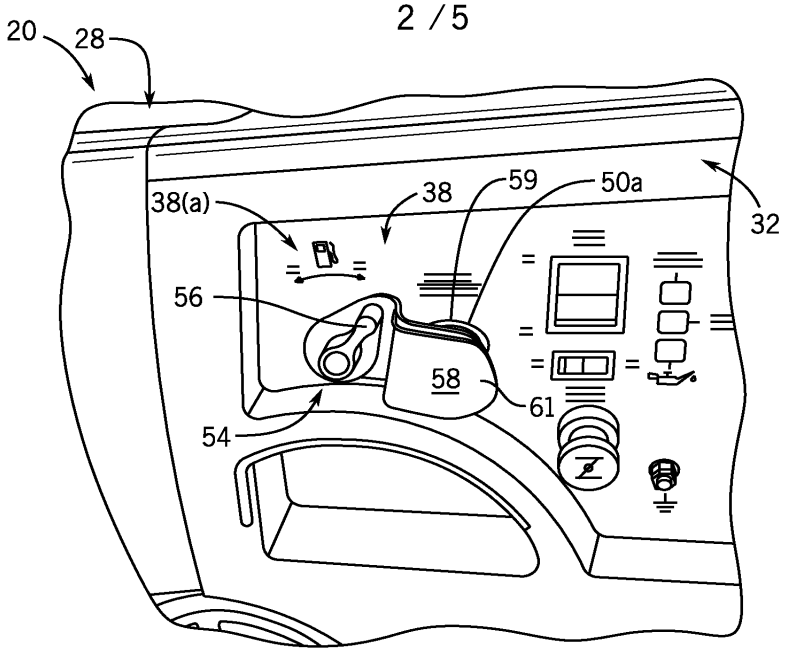

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FIG. 2

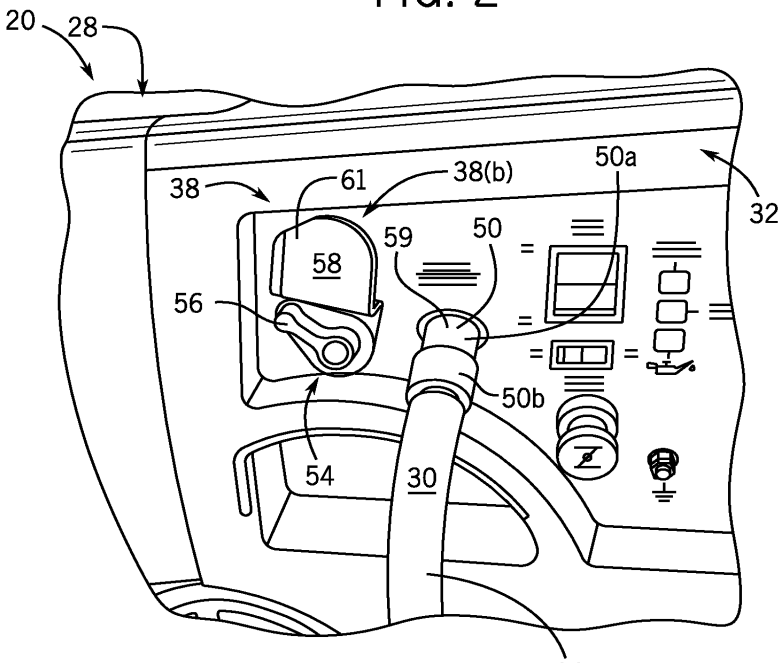

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FIG. 3

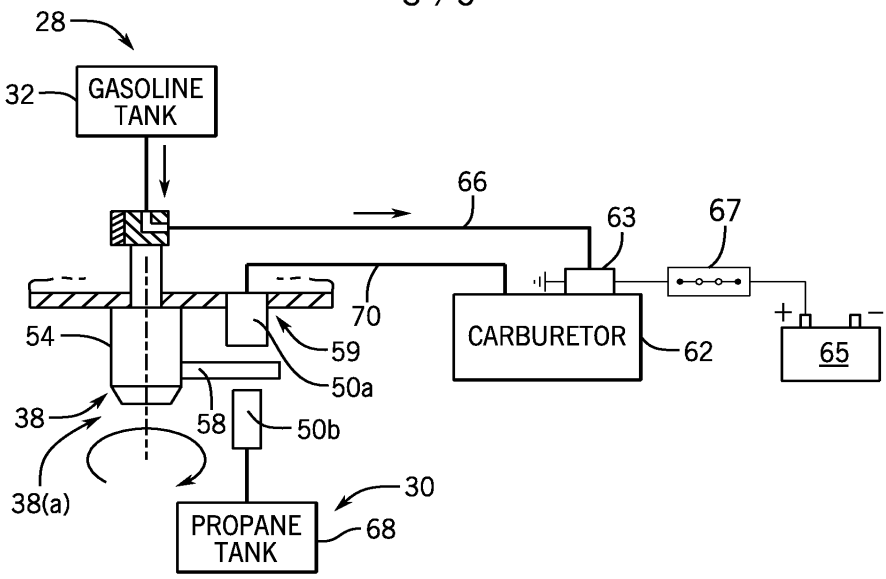

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FIG. 4A

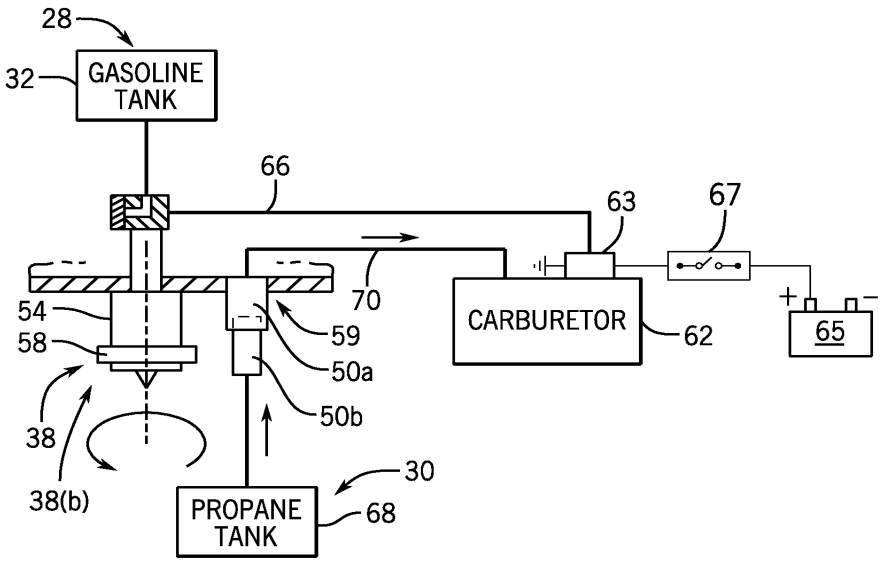

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FIG. 4B

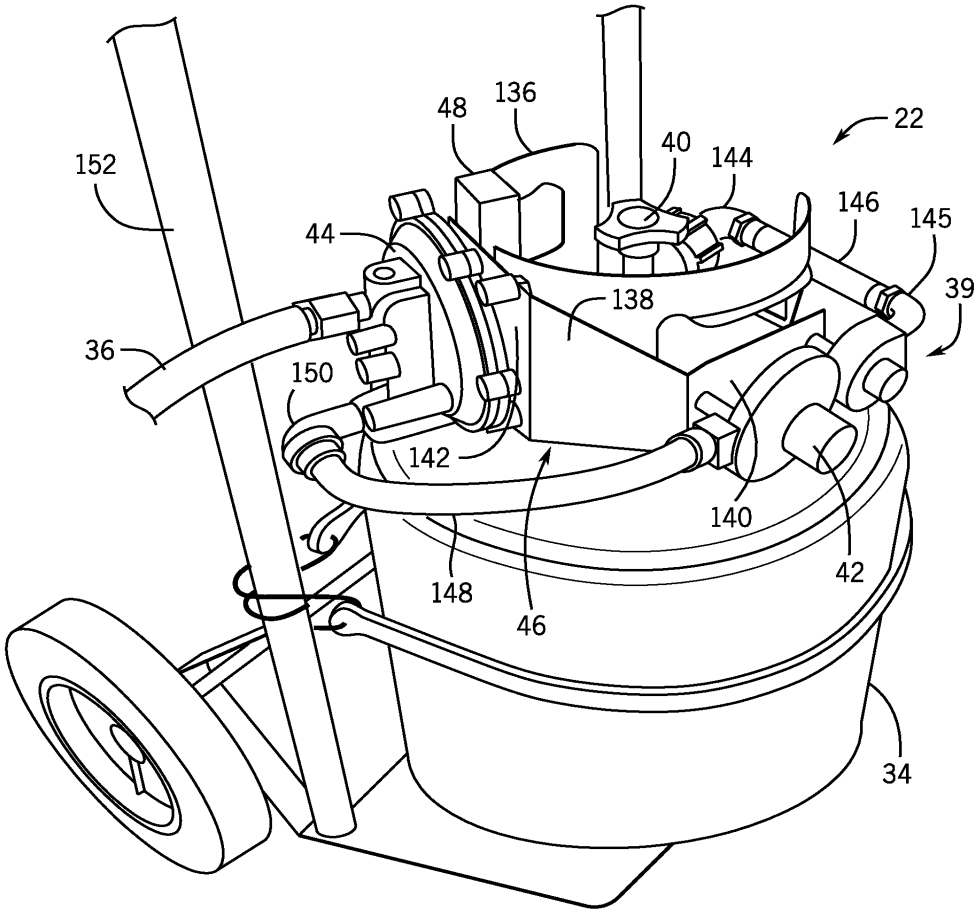


FIG. 5

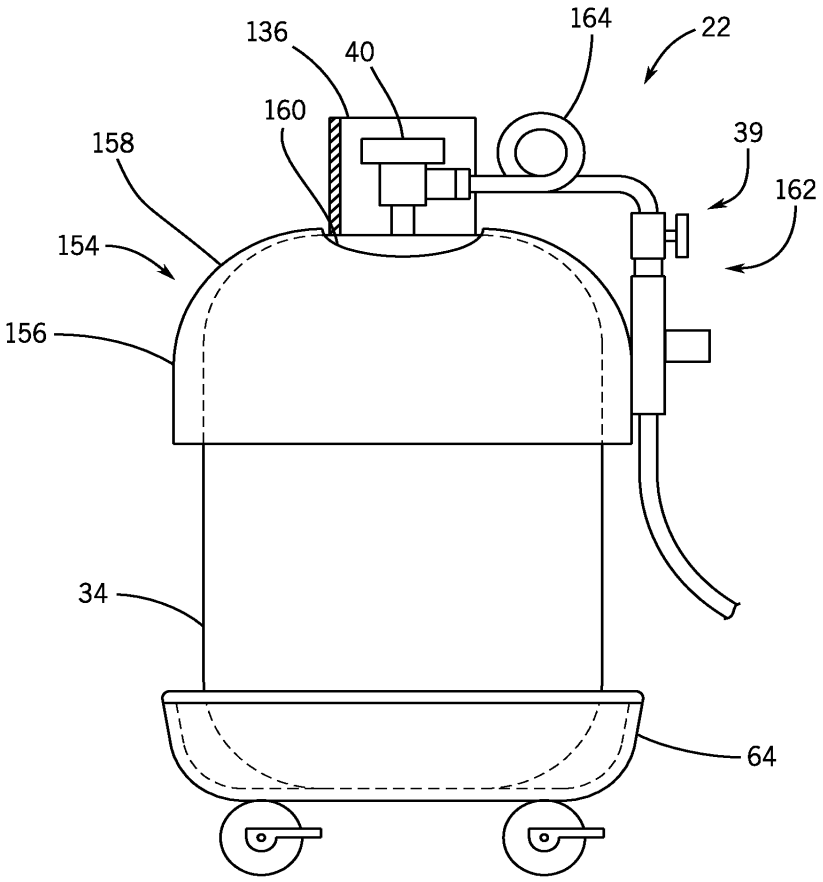


FIG. 6